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LAND ECONOMICS

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LAND ECONOMICS

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The Automotive Industry: A Study in Industrial Location

By NEIL P. HURLEY*

THE geographical patterns which characterize different industries are a compound of economic considerations, socio-historical factors and happenstance. Especially true is this of the geography of automotive manufacturing in the United States. This study will attempt to dissociate the myriad threads in the intricate web of causal factors which have shaped, and are now re-shaping, the locational profile of America's automotive production.

The development of the industry in Detroit is a classic instance of how historical accident and socio-economic factors combine to determine industrial sites. The fact that Henry Ford, Ransom E. Olds, Elwood Haynes and Charles Duryea lived in Michigan undoubtedly had much to do with the state of Michigan, and particularly Detroit, becoming the cradle of auto manufacturing.[1] This accords with Piquet's observation in 1925: "A recent canvass of a 100 leading industries has disclosed the fact that in almost all cases the location of the plant was the founder's home town. That, and not industrial factors, was the reason for the location."[2]

There were nevertheless sound commercial reasons why automotive manufacturing succeeded in thriving in the Detroit area. First, the vigor of such industries as machine shops, tool and die makers, and parts manufacturing exercised an unmistakable attraction on car producers. Bankers in the east were less willing to furnish short-term credit to the infant industry's promoters than were the more progressive middle West financiers. An additional factor in favor of locating in and around Detroit was that gas engines were preferred in Michigan as opposed to the steam engine (favored in Massachusetts) and the electric motor (in Connecticut); Ohio had been experimenting with all three. Naturally Michigan had a decided advantage over the other states when the gas engine proved to be the most efficacious way to power an auto. Otherwise, New England could have

* Jesuitenkolleg, Innsbruck, Sillgasse, Austria.

[1] For early locational influences in the auto industry see E. M. Hoover, Jr., *Locational Theory and the Shoe and Leather Industries* (Cambridge: Harvard University Press, 1937), p. 247; Allan Nevins and F. E. Hill, *Ford: The Times, the Man, the Company* (New York: Charles Scribner's Sons, 1954), pp. 20-35; Alfred P. Sloan and Sparkes Boyden, *Adventures of A White Collar Man* (New York: Doubleday Doran & Company, 1941).

[2] J. A. Piquet, "Scientific Versus Haphazard Plant Location," *Industrial Management*, June 1925, p. 330.

easily become the motor region of the world.[3]

Other factors of varying weight played their part, too. Thus the importance of motor boats and commercial vessels on the Great Lakes resulted in an important marine-engine industry developing in the area; this lent impetus to the production of all types of engines, including those for autos as well. The horseless carriage, a hybrid product developed by crossing a buggy with a marine engine, would naturally be manufactured in a region such as that of the Great Lakes.[4] Moreover, Detroit, Cleveland and satellite cities were specialists in pressed steel, malleable iron, brass parts, springs, rubber tires, paints and varnishes, materials which were indispensable for the assembly of a horseless carriage.

The mid-West, with its sprawling land expanses and scattered trade centers, was more transport-conscious than was the East. Its flatland surfaces were ideal for experimentation inasmuch as the first autos lacked the extra horespower to navigate hilly terrain. Besides, glacial gravels were sufficiently plentiful in the region to make road-building an easy matter. Lastly, an intense spirit of resourcefulness and enterprise, so characteristic of pioneer groups, flourished in the mid-West in contrast with the more conservative, tradition-bound East.

So much then for historical background. To understand the subsequent maturing of the industry it is necessary to recall some basic principles of locational economic theory. Every fabricating industry, such as auto manufacturing, lends itself to the combined pull of five vector forces: raw materials, fuel and power sources, market availability, the proximity of labor and capital pools, and transport arteries. Using these five rubrics, an attempt will be made to explain the geographical patterns which the American auto industry has historically assumed.

Locational Factors Peculiar to the Automotive Industry

The assembly line nature of the industry rules out its being oriented to raw materials; it does not consume raw materials directly but in the form of semi-finished and finished components such as steering shafts, cylinder blocks, bearings, axles, etc. The auto industry is so dependent on diverse material sources that when its assembly lines stop for lack of sales "a tide of secondary idleness washes through hundreds of other cities across the nation." A Ford chemist stated before World War II that Ford cars used cotton from 433,000 acres, wool from 800,000 sheep, hair from 87,500 goats, 11,200 acres of corn, 12,500 acres of sugar cane, 61,500 acres of soy beans, not to mention a fifth of the nation's steel and staggering quantities of rubber, glass, and textiles.[5]

The auto industry is not linked to any invariable factor such as land in the case of agriculture, or climate and flat land in the case of aircraft plants,[6] or raw materials as in the extractive industries.[7] Extractive industries, such as mining, lumber and whaling, have little locational freedom; reproductive industries, such as tobacco, cotton and fruit growing, must conform strictly to the natural conditions of soil, climate and topog-

[3] For further details consult Paul M. Banner, *Competition in the Automobile Industry* (Unpublished Doctoral Thesis, Cambridge: Harvard University, 1952), pp. 22-27.

[4] Since an abundance of the supply of hardwoods was present in the area at the turn of the century, the Mid-West attracted more than sixty percent of the total carriage production in the United States at that time. *Loc. cit.*

[5] Ralph Woods, *America Reborn: A Plan for Decentralization of Industry* (London: Longmans, Green & Company, 1939), p. 274.

[6] William G. Cunningham, *The Aircraft Industry: A Study in Industrial Location* (Los Angeles: Lorin L. Morrison, 1951), pp. 25 ff.

[7] C. H. Cotterill, *Industrial Plant Location: Its Application to Zinc Smelting* (St. Louis: American Zinc, Lead & Smelting Company).

raphy, while service industries, such as retailers, brokers and barbers, are predominantly market- and therefore urban-oriented.[8] Fabricating industries, such as auto producing, generally seek that site which affords optimum access to all the materials ingredient in the final product. This necessitates a compromise location.[9]

Essential to an understanding of the locational policies in the auto industry is its oligopolistic and highly competitive nature. There are three giant producers (General Motors, Ford and Chrysler) and three smaller independent producers of note (American Motors, Kaiser-Willys and Packard-Studebaker).[10] Entry into the field is extremely difficult, if not virtually impossible, due to the large capital investments required to maintain a vertically integrated productive process, a nation-wide dealer system and the exorbitant costs attendant upon advertising and establishing company prestige and goodwill.[11] Indicative of the difficulty involved in offering more than negligible competition to General Motors, Ford and Chrysler is the fact that together these three firms control about 95 percent of the market.[12] The fact that within a span of a few years six independent companies merged into three companies indicates the oligopolistic nature of the American auto industry. Because of the sensitivity of their product to the business cycle and because of the huge investment requirements in the annual model change-over, the auto producers are quick to exploit any advantages which sound plant site decisions may yield. Such advantages are linked with: (a) the assembly-line nature of the industry; (b) freight-rate practices; (c) the economies of specialization; (d) labor volatility; (e) the process of technical maturing; (f) the pyramidal nature of large-scale production in the auto industry; (g) managerial decentralization policies among the "Big Three"; and (h) the multiplier effect in regional expansion.

The Assembly-Line Nature of the Automotive Industry

It is a well-known fact that the auto industry pioneered in mass-production techniques and spawned the assembly-line, which today can turn out a finished car every minute.[13] The refined subdivision of labor, the endlessly moving belt, the concourse of sub-assembly lines feeding into the main belt, the logistical wizardry required to supply basic items without, however, maintaining large plant inventories, the minute detailing of "lead-time" production plans to harmonize a process extending from the blue-

[8] G. T. Renner, "Geography of Industrial Localization," *Economic Geography*, July 1947, p. 167.

[9] E. B. Alderfer and H. E. Michl, *The Economics of American Industry* (New York: McGraw Hill Book Company, 1950), p. 145.

[10] All three firms were the product of mergers. As of 1953 there were six independent auto producing firms: Nash and Hudson (which later merged into the American Motors Company), Kaiser and Willys (later combined into Kaiser-Willys) and Packard and Studebaker (subsequently merged into Packard-Studebaker).

[11] Harold G. Vatter, "The Closure of Entry in the American Automobile Industry," *Oxford Economic Papers* (New Series), October 1952.

[12] From 1946 to 1954 the share of the market that went to the so-called "Big Three" (General Motors, Chrysler and Ford Motor Company) rose from 85.5 percent to 95.6 percent. General Motors' proportion has been as high as 55 percent; in 1957 it fell to 45 percent but in 1958 rose again to 50 percent. Ford's share of the automobile market hovers between 22 and 28 percent while Chrysler's proportion ranges from 15 to 20 percent. "New Hands at the Wheel of an Auto Empire," *U. S. News & World Report*, September 5, 1958, p. 63. Also *cf.*, Banner, *op. cit.*, chapter II. Another characteristic of oligopoly in the industry is General Motors' traditional role as the price leader. "Has GM Lost Price Leadership?", *Business Week*, November 9, 1957, p. 171.

[13] E. G. Fuller, "Automobile Industry in Michigan," *The Michigan Historical Magazine*, April 1928, pp. 280-296; Philip Van Doren Stern, *Tin Lizzie: The Story of The Fabulous Model T Ford* (New York: Simon & Schuster, 1955); Allan Nevins and Frank Ernest Hill, *Ford: Expansion and Challenge: 1915-1933* (New York: Charles Scribner's Sons, 1957); Harry Barnard, *Independent Man: The Life of Senator James Couzens* (New York: Charles Scribner's Sons, 1958).

print stage to the display floor—all have captured the imagination of the world and elicited the laments of sociologists and industrial psychologists the world over.[14]

The creation of the "Model T" Ford[15] added to the two fundamental principles of standardization and inter-changeability three other steps: (1) the orderly progression of the product through the shop in a series of planned operations arranged so that the right part always arrives at the right place at the right time; (2) the mechanical delivery of these and of the assembled product to and from the operators; and (3) a breakdown of operations into their simple constituent motions.[16]

The assembly-line permits larger integrated firms with annual sales volumes of tens of thousands of autos to offset the costly investment for machines, jigs, dies and tool fixtures by means of volume production of standardized parts. Only the "Big Three" can afford the burdens of a heavy automation program and the yearly re-tooling which accompanies model re-design. The assembly-line operation, in permitting a divorce among parts-manufacture, sub-assembly and final assembly, enables centralization of operations where component and semi-finished parts are concerned and a decentralization of regional assembly plants. Consequently, the "Big Three" have centralized the assembly of component parts and units (e.g., chassis, pistons, transmissions) in and around Detroit, to take advantage of nearness to mid-Western suppliers and then have arranged to ship these assembled units to regional assembly plants for final assembly in order to reap the economies of proximity to local markets. This divorce between the parts manufacture and the final assembly phase enables sizeable economies; however, it leads to vulnerability in the event of civil or military disaster. This was demonstrated in 1953 when one of the nation's greatest industrial fires struck the General Motors hydromatic-transmission plant at Livonia, Michigan and crippled some twenty percent of the industry's auto production.[17]

One sees how geographically strategic is the location of Detroit, equidistant between both coasts and advantageously situated for shipment of parts to regional assembly plants in any part of the nation.[18] The economies which attach to the centralization of facilities manufacturing auto parts and accessories become obvious when one considers how dependent the early phases of auto production are on nearby industries. In the Great Lakes area are concentrated such vital industries as electric generating stations, electrical machine producers, foundry shops. Besides, the iron ore resources of the Lake Superior region and the proximity of steel centers such as the Chicago-Gary area, Pittsburgh-Cleveland area, not to mention Akron's rubber supplies and the area's rail and water transport facilities, are location factors of great moment. The early phase of parts manufacture and primary assembling is then distinctly materials-oriented and labor-oriented and as such seeks out urban locations near basic suppliers and pools of semi-skilled and skilled workers. The later phase of final assembly is market-oriented and is therefore decentralized to reduce transport costs to the dealer.

[14] Charles R. Walker and Robert H. Guest, *The Man on the Assembly Line* (Cambridge: Harvard University Press, 1952), p. 180 ff.

[15] Peter Drucker, *The New Society* (New York: Harper & Brothers, 1950), p. 1.

[16] Walker and Guest, *op. cit.*, pp. 10-11.

[17] William B. Harris, "The Great Livonia Fire," *Fortune*, November 1953, p. 132 ff. Also "General Motors Segregates Its Transmission Output," *Automotive Industries*, June 1, 1954, p. 33.

[18] J. A Quinn, "The Hypothesis of Median Location," *The American Sociological Review*, April 1943, pp. 148-156.

Freight Rate Practices in the Automotive Industry

Prior to 1936 the industry's advertised price differed markedly from delivered price because of accessories, state and local taxes, and carrying charges on sales-financing contracts. In that year the Automotive Manufacturing Association published a list of agreed-price quotations. This led to the practice of including freight charges from the home plant (Detroit in the case of the "Big Three" and most independents) to the regional assembly plant in the final selling price. This meant that the customer paid freight on a fully assembled car shipped from Detroit even though the car was actually shipped unassembled from Detroit to a plant near the dealer. Whereas only four assembled cars can be loaded into a freight car, some twelve "knocked-down" (unassembled) cars can be shipped from Detroit and later assembled into final form for distribution.[19] In any event the customer pays the freight bill—f.o.b. Detroit. Supposing the car were assembled in New Jersey and marketed in New York, using 1955 prices, the differential between the shipping costs incurred by the producer and the freight bill paid by the customer would be $50 a model.[20]

By applying modern techniques of linear programming to determine the most profitable location of regional assembly plants in relation to earlier assembling phases and later marketing operations,[21] companies such as Ford and General Motors can, because of their nation-wide network of assembly plants, operate their own basing point system. The only difference between the method employed in the auto industry and basing point is that the customer absorbs the freight charge, not Ford or General Motors. The transportation charge, with its element of "phantom freight," has in the past swelled the profits of those auto producers who could avail themselves of the practice.[22]

The more common practice in American industry (e.g., steel) is freight absorption by the manufacturer even to the point of quoting a lower delivered price in more remote markets than in the home market. In the case of General Motors and Ford, however, there is the anomalous situation in which a seller has less competition from producers in a remote market than in the home market.[23] The apparently inflationary nature of freight policies of Ford and General Motors are understandable in the light of the industry's concentration in the Michigan area, the vertical structure of the industry's production process and the assembly-line nature of its operations. Other industries with different structures must follow other freight pricing policies;[24] one should not

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[19] This figure is based on the estimate of industry experts who insist that it is unthinkable to give a figure of 40 "knocked-down" autos per freight car. The number 40 is the figure found in the 1950 edition of E. B. Alderfer and H. E. Michl, *The Economics of American Industry*, *op. cit.*, p. 165.

[20] Further savings are possible, obviously, when cars are transported from the assembly plant to the local dealers on specially designed two-story motor carriers. *Ibid.*, p. 165.

[21] The use of computers and linear programming are becoming widespread management tools in determining the most profitable distribution arrangements in the auto industry. The author is indebted to a pilot study done by John F. Kain, *Linear Programming—An Answer to the Automobile Distribution Problem* (Mimeographed Copy, Bowling Green College, 1957).

[22] It has been estimated that General Motors made $33 million in 1938 on "phantom freight"; the Federal Trade Commission announced that the corporation's profits for that year were $77 million. If the "phantom freight" profits were accurately gauged, then 42 percent of General Motor's profits in 1938 were from this single source. "Chevrolet," *Fortune*, January 1939, p. 108.

[23] Naturally, Chrysler and the independent auto firms sought to have the Interstate Commerce Commission stabilize the situation by lowering the Detroit freight rate and by increasing rates from branch assembly plants. "Auto Freight Row," *Business Week*, December 2, 1950, pp. 20-21; also, *Hearings Before the Subcommittee on Automobile Marketing Practice of the United States Senate Interstate and Foreign Commerce Committee. Statement of Mr. Frederic G. Donner, Vice-President of General Motors, 1956.*

[24] E. M. Hoover, *The Location of Economic Activity* (New York: McGraw Hill Book Company, 1948), p. 55.

forget that dealerships play a critical role in the auto business. As members of the service or tertiary segment of our economy, auto dealers are urban-oriented.[25] Where population density is heaviest, there are the dealers and where the dealers are close by will be found the regional assembly plants. At this phase of operations decentralization brings the greatest rewards.

The Economies of Specialization in the Automotive Industry[26]

In the earlier stages connected with manufacturing parts and accessories the auto industry reveals a nucleated pattern designed to reap the competitive advantages associated with (1) the principle of multiples, (2) the principle of the massing of reserves, and (3) the principle of bulk transactions.

The principle of multiples offers a major producer the opportunity to offset what is known as the imperfect divisibility of units of equipment and labor. An example will make this clear. In the Detroit Plymouth plant there are, say, four key pieces of equipment: (1) a 6-spindle boring machine which roughbores cylinder blocks two at a time; (2) a multiple spindle drill press which drills 110 holes simultaneously; (3) a special automatic 6-spindle grinder which faces the hand valve seats at the rate of 90 motor blocks per hour; and (4) a milling machine which cuts pistons to specified dimensions.[27] Assuming that these machines are used in successive steps and that daily unit capacities for these machines are respectively 1000, 1250, 1500, and 3000, then the plant's daily output should be 15,000 or some multiple of 3000 higher than 15,000 if all the machines are to be used at full capacity. It is this principle of multiples which is continually at work in auto centers such as Saginaw, Lansing, Pontiac and Detroit, where large scale economic concentration insures a minimum of waste, curtailed production and "down-time" for heavy equipment.

How does the principle of the massing of reserves operate in large auto producing units? A giant car manufacturer is in a position to dispense with the larger margin of inventory resources which smaller operators must maintain against demand fluctuations, production interruptions, accidents, etc.[28] With a far-flung system of branch assembly plants the "Big Three" can readily estimate the individual requirements of each branch more closely than a smaller competitor might since they know statistically that the fluctuations of requirements in each branch will cancel out. This is an obvious advantage at the concentrated stage of automotive operations where production is geared for a national demand and not just for a local demand as is the case with the regional assembly plants.

As for the principle of "bulk transactions," it is fairly obvious that large manufacturers enjoy considerable bargaining power in closing contracts for material purchases, advertising and dealer arrangements. A company such as Kaiser-Willys, with an average annual output of some 100,000 cars, could not

[25] "How to Build a Dealer Empire; Strategy of the Edsel Campaign," *Business Week*, June 22, 1957, p. 52 ff. This is an interesting account of the detailed market studies the Ford Motor Company made in order to introduce a new car onto the market.

[26] Henry Ford once said: "There is no point in centralizing manufacture unless it results in economies. If we, for instance, centered our entire production in Detroit we should have to employ about 6 million people." Cited in Lewis Mumford, *Technics and Civilization* (New York: Harcourt, Brace & Company, 1934).

[27] Alderfer and Michl, *op. cit.*, p. 158.

[28] For a discussion of the role of mass production economies in General Motor's operation, see, *Profit Margins at General Motors: A Background Study in Management Action, The Corporate Director*, American Institute of Management, July 1956. For a short treatment of the dimensions of risk and investment involved in predicting market demands and determining new car designs, see, Joseph C. Ingraham, "Detroit's Billion-dollar Gamble," *The New York Times Magazine*, June 29, 1958, pp. 16-17.

possibly sustain the tremendous overhead burdens which a General Motors must carry as a condition for its extensive plant expansion, automation programs, annual model change-overs and "hippodrome" advertising campaigns.[29] Not only are important items such as gas, electricity and water sold to industrial consumers at graduated rates, but a predictable and sizeable volume of business furnishes a safe margin for capital investment and bulk buying at propitious fluctuations of the market and the business cycle.[30]

Geared to volume production in order to avail itself of the triple advantages of the principle of multiples, the massing of reserves and bulk transactions, the industry seeks an expanding market. In doing so its aim is "to create both consumer satisfaction and consumer desire, and at the same time."[31] In executing its program of planned obsolescence, the auto manufacturers employ classy dealers' showrooms, mass-advertising and the annual model change to create consumer dissatisfaction within a relatively short time. The fact that some degree of success has been attained in this respect is borne out by statistics: more than 35 million families own almost 50 million cars; 35 million of these cars are postwar vintage and some 12 percent of all car owners in America own two or more vehicles.[32] Thus it becomes relatively clear how specialization and volume production go hand in hand. The result has been the entrenchment of three companies as production leaders with negligible rivalry from other producers, the geographic concentration of the early phases of manufacture in Michigan and the diffusion of assembly plants to handle regional demands of a national market.[33]

Labor Volatility in the Automotive Industry

The most unpredictable labor market in the entire economy is to be found in the automotive industry and the most mercurial labor center is unquestionably Detroit. Consider some essential facts. Work is seasonal; mass lay-offs invariably occur during the model change-over period. The greater part of the working force is not skilled; reliable estimates claim that 65 percent of the industry's total force of 900,000 is made up of assemblers, janitors, sweepers, stock shipping clerks, receivers, checkers and sundry unskilled employees.[34] The instability of the industry is further aggravated by the fact that the product marketed is one whose purchase can be deferred if signs of recession set in.[35] Consequently, both dealers and personnel lead uncertain lives.[36]

This uncertainty has led to the creation of the powerful United Automobile Workers' Union which has secured high wage scales for its members to offset the disincentives of assembly-line monotony and seasonal lay-offs. Few industries have had labor-management relations

[29] "Smaller Makers of Autos Hit Hard," *The New York Times*, April 18, 1954, pp. 1, 9. Also, Charles E. Egan, "General Motors is Subject for Case Study in Bigness," *The New York Times, Sunday, News of the Week in Review*, December 11, 1955, p. E 7.

[30] E. M. Hoover, *The Location of Economic Activity, op. cit.*, p. 80.

[31] A statement of Alfred P. Sloan, Jr., then Chairman of the Board of Directors for General Motors. Quoted in James C. Jones, "How They Plan the Car You Want," *The American Legion Magazine*, June 1954, p. 51.

[32] *Automobile Facts and Figures*, (37th Edition) Automobile Maufacturers Association, 1957, pp. 20-35.

[33] For a treatment of the incentives which exist in diverse types of business toward agglomeration into a relatively small number of clusters. *see*, E. M. Hoover, *The Location of Economic Activity, op. cit.*, pp. 120-121.

[34] *Employment Outlook in the Automobile Industry*, United States Bureau of Labor Statistics, Bulletin Number 1138, Washington, D. C., 1953; also, *Automobile Facts and Figures, op. cit.*, pp. 62-68.

[35] The industry is regarded by its representatives as being income elastic and not price elastic. Thus, it is believed, that annual income levels of the average American consumer affect car sales more than the price fixed by producers. Within limits, this is undoubtedly true.

[36] This was dramatically seen in the sharply curtailed payrolls, shortened work schedules and skip-weeks which the recession in early 1958 caused in the motor city of Detroit. A. H. Raskin, "Detroit: Focus of the Basic Duel," *The New York Times Magazine*, May 4, 1958, p. 7 ff.

which have been so marred by mutual bitterness and class anatagonism.[37] The nature of operations in the automotive industry is such that the union is ever seeking new claims; the "guaranteed annual wage" demand was a counterweight to the adoption of automation programs by car producers. Critically dependent upon a large urban pool of unskilled, semi-skilled and skilled employees, the industry has reluctantly yielded to union requests.[38]

The auto industry's labor situation has serious locational implications: it is a general principle of locational theory that a less costly center of labor diverts the industrial process from its cheapest transportation point at that moment when labor savings at a new site exceed the additional transportation costs.[39] Detroit labor costs are very high due to a combination of factors; the concentration of the industry in a single area making it vulnerable to strikes and work stoppages; the strength and quality of the union and its leadership; the uncertainty of income payments; the high cost of living in Detroit and environs; the repetitive nature of the industry's operations with concomitant psychic dissatisfaction which must be compensated for in a monetary manner.[40]

The result is a tendency to seek plant sites in areas where labor is cheaper, less troublesome and free from a tradition of hostile labor-management relations. Although industry-wide bargaining insures equality of payment throughout the nation, definite advantages nevertheless accrue to, say, a Southern location rather than one in the mid-West. Workers there will be much more satisfied with wage rates than those in a city with a high living standard. Secondly, no tradition of labor strife exists. Thirdly, management can install labor-saving machinery and automatic equipment more readily in such a branch plant than in an established one. This is not to say that automation eliminates workers over the long run but merely to assert an undeniable fact—namely, the resistance of workers and the union to automation. There has been a real decentralizing force at work in the industry; management cherishes harmonious relations with its labor force and will go to great expense to achieve this ideal. One manufacturer moved his plant 400 miles to insure continuous production, free from the frequent and violent labor disturbances he experienced at his original site.[41] The deviation in the industry from traditional patterns of nucleation is due in large measure to the desire to mitigate as much as possible the volatility and antagonism found historically in the Detroit region.

The Process of Technical Maturing in the Automotive Industry

Discussion of the auto industry's labor problems leads naturally into the question of tehnological advance. The working staff, which is trained for highly specialized operations even of an unskilled nature, has been highly paid as we

[37] The beginnings of the United Automobile Workers' Union are found in, Irving Howe and B. J. Widick, *The UAW and Walter Reuther* (New York: Random House, 1949), pp. 1-309.

[38] Here the principle of the "massing of reserves" applies in reverse inasmuch as labor, by use of the ritual strike, can force management's hand. The auto union, for example, protested in the winter of 1951 when Ford decided to decentralize the River Rouge plant in the name of national security without, at the same time, refusing to divert any of its billion dollar defense contract to its Iron Mountain-Kingston plant in upper Michigan, a site well outside the defined target area for urban localities. "Union Protests Sale of Ford Plant," *The Wage Earner*, December 1951, p. 6.

[39] Carl J. Friedrich, *Alfred Weber's Theory of Location* (Chicago: University of Chicago Press, 1929).

[40] Peter Drucker, *Concept of a Corporation* (New York: The John Day Company, 1946), pp. 176-208; also, Walker and Guest, *op. cit.*, pp. 156-163.

[41] An incentive to plant re-location also exists where labor and tax policies are influenced by local or state legislation. For instance, one Wisconsin firm, with an annual tax charge of $68,000, moved to another state where its tax liability was $16,000 (or 75 percent) less. Ralph L. Woods, *op. cit.*, pp. 341-343.

have seen. The labor pool has had a monopoly position due to the extreme degree of concentration of production in and around Detroit. However, with increasing scatter the industry's dependence on a central labor pool becomes concomitantly relaxed. The locational histories of most individual industries have typically involved an early stage of increasing concentration followed by a stage of redispersion.[42] The auto industry reflects this characteristic. As an infant industry with peculiar problems it succeeds in combining appropriate basic skills with managerial resourcefulness, financial support and enterprising engineers. With the introduction of standardization of parts and mass-production techniques the industry became rooted in the Detroit area where it could be close to independent suppliers.

Since 1940, however, the industry has been in a maturing stage. The war led to many government contracts and served as a catalytic agent in expanding the industry and in dispersing it geographically. The application of automatic controls and electronic devices, the new methods of marketing and distribution, the refinement of advertising techniques have all cooperated to bring the industry out of its period of industrial adolescence.[43] Competition and scientific advances have eliminated many of the crudities and accidental elements in car production. The overhauling of the monolithic Ford Empire in the mid-1950's has been dramatic proof of this fact.[44]

Maturity of the industry has brought with it what might be called an "hour-glass pattern." Flowing down from some 25,000 suppliers of independent parts and accessories through the concentrated plants of Ford, Chrysler, General Motors corporations and independent producers, America's autos gradually take shape and move outward toward the regional assembly plants and finally to some 45,000-odd dealers. The top half of the hour-glass is materials- and labor-oriented; the assembly plants in the early stages are dependent upon the basic suppliers in the Michigan area. These plants represent the stem of the hour-glass. From these Detroit-clustered plants are diffused the component parts and sub-assemblies which reach the decentralized branch assembly plants. These assembly plants, located near regional dealers, finish the assembly and send the finished product on to the 45,000-odd dealers, who represent the lower half of the hour-glass pattern. This pattern has been the result of years of integration, both vertical and horizontal as well as forward and backward. A brief history of the auto industry's integration reveals a stress on engineering and production in the early history of car production. Later, marketing became important and caused the disappearance of auto wholesaling. Forward vertical integration took place in the form of factory branches and dealerships controlled by the company. It was only to be expected that auto producers would want to exercise surveillance over car dealers where it concerned problems of financing, maintaining customer goodwill, "repeat" sales and institutional brand advertising. Vertical backward integration arose when Ford bought coal and iron ore mines, built and purchased steel plants, glass factories, rubber plantations, etc. In time, General Motors developed a refined system of horizontal

[42] E. M. Hoover, *The Location of Economic Activity*, *op. cit.*, pp. 174-176.

[43] An excellent treatment of the influence of automation on geographical patterns in industry is to be found in, David G. Osborn, *Geographical Features of the Automation of Industry* (Chicago: University of Chicago Press, 1953). "Detroit automation" (the mechanical counterpart of electronic feedback control) is explained in John Diebold, *Automation—The Advent of the Automatic Factory* (New York: D. Van Nostrand Company, 1952); also, Hans Roeper, *Die Automatisierung* (Stuttgart-Degerloch: Verlag Dr. Heinrich Seewald, 1958).

[44] Alderfer and Michl, *op. cit.*, p. 167.

integration, manufacturing such diverse products as diesel locomotives, electric fans, frigidaires, Allison engines, AC spark plugs, Delco radios and a host of other products (numbering in all over 40).[45] Over the years both Ford and General Motors have extended themselves forward, backward and laterally until the "hour-glass pattern" has emerged. Seeking to minimize costs and to maximize profits the large-scale auto manufacturers have concentrated where economic advantages dictated and decentralized to take advantage of market proximity at the final assembly stage. Since the finished product is bulky and susceptible to the weight-gain interpretation of locational economics, the market will always exert a strong locational pull on final assembly plants.[46] The f.o.b. Detroit pricing practice made this pull even stronger by making the consumer pay the all-rail-freight charge for a fully assembled car even when it is shipped more cheaply as a so-called "knocked-down" car.

Managerial Decentralization Policies Among the "Big Three"

Although managerial decentralization is a radically different concept from plant decentralization, both are not completely unrelated. It is common to find progressive firms with avowed managerial decentralization policies constructing modern one-story country plants away from congested urban areas. Divisionalization, as managerial decentralization is called in the auto industry, is a common practice among the "Big Three." Alfred P. Sloan first initiated the policy in his tenure as President of General Motors from 1923 to 1937.[47] Both Ford and Chrysler, after many long years of remaining centralized in all levels of operations, followed General Motors' divisionalization program in the mid-1950's.[48] At the head of each division (e.g., Buick, Pontiac, Chevrolet in the case of General Motors) is a divisional chief who directs the affairs of the entire division as if it were an autonomous company in production and sales; moreover, a controller is charged with the financial supervision of each unit so that a closer check on costs may be maintained. Autonomy is so complete that divisions really compete with one another.

The significance of divisionalization for location, however, is that autonomy in divisional operations enables segments of the company's activities to seek sites outside of Detroit and away from the traditionally congested loci of auto production. Managerial decentralization reduces impersonal human relationships and as such enhances personnel satisfaction. Job satisfaction is difficult to measure empirically but it is a parameter which all management experts accept today for increasing plant efficiency. A moderate-sized community plant within an autonomous divisional unit can be placed in a semi-rural area, enabling an employee to ride from his bungalow-

[45] Ford's vertical integration and its historical origins are treated in Garet Garret, *The Wild Wheel* (New York: Pantheon Books, Incorporated, 1952), pp. 96 ff. Ford's tapering integration is described in Alderfer and Michl, *op. cit.*, pp. 162-163. For a brief, popular discussion of General Motor's horizontal integration, *see*, "The Battle of Detroit," *Time*, November 1, 1954, pp. 90.

[46] C. J. Friedrich, *op. cit.*, passim.

[47] Peter Drucker, *Concept of the Corporation*, *op. cit.*, pp. 41-71.

[48] The rapid growth of the American economy and its bellwether industry of auto production together with close competition among the "Big Three" have caused successive changes in organization structure in General Motors, Ford Motor Company and the Chrysler Corporation. General Motors' organizational development can be traced in Peter Drucker, *Concept of the Corporation*, *ibid.*; "New Hands at the Wheel of an Auto Empire," *op. cit.*, p. 60 ff. Ford's re-organization is described in: "An Auto Empire Decentralizes and Reorganizes," *Business Week*, October 17, 1953, pp. 130-4; "Ford's Fight for First," *Fortune*, September 1954, p. 123 ff.; James C. Jones, "The New Ford Drive," *The American Legion Magazine*, January 1955, p. 22 ff.; "Co-Captains in Ford's Battle for Supremacy," *Life*, February 28, 1955, p. 84 ff; "Ford Gets Full Line at Last," *Business Week*, June 22, 1957, p. 45 ff.; Chrysler's managerial posture has been set forth in "The Chrysler Situation," *Fortune*, April 1954 and "Chrysler Restyles Its Executive Structure," *Business Week*, November 3, 1956, p. 85 ff.

type home to a spacious parking lot near the plant, free from all the inconveniences of commuting. In addition, auto plants generally have high land-extensive requirements for in-line productive processes which cannot ordinarily be accommodated by city lofts or a crowded urban site. Detroit has consequently experienced the migration of many types of businesses, including automotive production, which are land-extensive.[49] Divisionalization serves to flatten out the organization chart and to dispose of a company's operations for that degree of physical plant decentralization which has been a notable phenomenon in the auto industry in the decade after the end of World War II.

The Multiplier Effect in the Regional Expansion of the Industry

Probably the greatest single force in mitigating the historical centripetal tendencies of the American auto industry is the growth of the broad middle-class suburban market. Constituting only 19 percent of the nation's population in 1953, America's suburban families accounted for 20 percent of the nation's spendable income. The automobile is not only a sought-after item in suburbia (with not a few families owning two cars) but the auto has made suburban and rural habitation possible.[50] With the establishment of new communities and new urban strips in the Pacific Northwest, the Old South, the Gulf Coast and the Pacific Coast, new markets will arise and prompt the auto industry to set up dealerships and regional assembly plants in the vicinity. The attraction of new, wealthy markets will likewise precipitate the building of metalworking facilities, tool and die establishments, foundries, parts and accessories manufacturers, who will seek to supply the needs of the regional plants which the industry will have introduced. A glance at the new assembly plants erected by the "Big Three" in the decade from 1945-1955 indicates a trend toward such dispersed sites as Los Angeles (General Motors, Ford and Chrysler); Atlanta (Ford and General Motors); Louisville (Ford); San Jose, California (Ford); Metuchen, New Jersey (Ford); Arlington, Texas (General Motors); Wilmington, Delaware (General Motors); and Framingham, Massachusetts (General Motors).

There are several multiplier effects at work in this regional expansion of the automotive industry. Motor vehicles are serving to accelerate the phenomenon of suburban living; as higher income levels become fixed in these non-urban locales an attractive natural market area arises for goods and services. Thus, in contributing to nation-wide decentralization the auto industry is effecting *pari passu* its own decentralization. In addition to this consumer multiplier effect there is also a consumer-goods multiplier effect noticeable. This consists in the relocation in newer regions of the United States of major industries and corporations which are large users of motor vehicles.[51] Sufficient demand on the part of newly situated customers can exercise a strong geographical magnetism on the auto industry, even at the earlier productive stages. Conversely, the relocation of basic suppliers of the auto industry is an invitation to auto producers to locate plants to be nearer to sources of capital, and to processed and unprocessed ma-

[49] Paul M. Reid, *Industrial Decentralization, Detroit Region, 1940-1950 (Projection to 1970)*, Detroit: Regional Planning Commission, June 1951.

[50] "The Lush New Suburban Market," *Fortune*, November 1953, p. 131; Joseph C. Ingraham, "Auto, Multiplying Faster than Man, Rule, Inconvenience and Frustrate Urban Life," *The New York Times*, January 28, 1957; and Neil P. Hurley, "New Patterns in American Commuting," *Social Order*, September 1958, pp. 343-349.

[51] This was undoubtedly one of the significant locational pulls in General Motors' selection of a plant site at Arlington, Texas to fulfill government defense contracts during the Korean episode.

terials, thus to minimize transport costs.

Similar trigger effects are also evident in locational changes in the earlier stages of production. The gradual depletion of iron ore sources in the Mesabi Range in the Lake Superior area is affecting a modification of traditional geographic patterns in the steel industry and less immediately on dependent consumer industries, of which the largest is the auto industry. Take the example of the Fairless Works which United States Steel Corporation put up in 1952 at Morrisville, Pennsylvania in order to be close to imported Venezuela ore and Eastern markets.[52] In the wake of further decentralization of the steel industry a production-multiplier effect will influence the auto industry to locate near the relocated steel mills and the metalworking shops which spring up around them.

Capital equipment multiplier effects should also be mentioned since budding industrial opportunities in new regions such as Dallas, Texas and Los Angeles, California attract investors and financial interests. Mention has already been made of the readiness of mid-West financiers to invest in the infant auto industry as contrasted with the conservative Eastern banking houses. Certainly the postwar boom made it relatively easy to float reasonably sound business ventures. The experience of the Kaiser Company in attempting to achieve entry in the automotive field proved the availability of capital in an expanding market economy.

Obviously, the multiplier effects can cooperate toward centralization equally as effectively as toward decentralization just as it can confirm the economic anemia of "stranded areas" (e.g., mill towns in New England and coal towns in Pennsylvania). However, the post-war trend in the auto industry has been toward scatter and the multiplier effects with its tandem reactions and mutual causation have helped the process to gain momentum.[53] Since 1940 the profile of American industry has undergone a marked change.[54] Although it will be decades before the primacy of Michigan as the nation's auto state will be seriously challenged, there seems little doubt that Michigan is losing its historic position of dominance.[55] To mention but one highly significant factor, automation is working a revolution in the auto industry as profound as that of Ford's assembly-line techniques. Automation effects the locational factors of space and labor suchwise that the industry is growing more "footloose" than it was formerly.[56] The "Big Three" of the auto industry are in a position to keep astride of the tide of expanding markets, technological advance, managerial decentralization and geographic de-concentration which has swept the entire American economy in the years

[52] The long-standing basing point system gave way in 1948 to the f.o.b. ("free-on-board") mill freight pricing policy. Under the latter system, proximity to markets exercises a strong locational pull.

[53] Input-output analysis studies can contribute to a better understanding of the casual interactions involved in the multiplier effect. "Considered from the point of view of the input-output scheme any national economy can be described as a system of mutually interrelated industries or . . . . interdependent economic activities." Wassily Leontiff, *Studies in the Structure of the American Economy* (New York: Oxford University Press, 1953), p. 9; also, Walter Isard, "Distance Inputs and the Space Economy," *The Quarterly Journal of Economics*, May and June 1951, pp. 181-198; 373-399 of Volume LXV.

[54] Glenn McLaughlin, "Regional Problems of Industrialization," Chapter IX, *Economic Reconstruction*, Ed., by Seymour E. Harris (New York: McGraw Hill Book Company, 1945), pp. 163-179.

[55] George Katona and James Morgan, "The Quantitative study of Factors Determining Business Decisions," *The Quarterly Journal of Economics*, December 1952, p. 73; Rex Henrickson, *Trends in the Geographic Distribution of Suppliers of Some Basically Important Materials Used at The Buick Motor Division—Flint, Michigan*, The Institute for Human Adjustment, The University of Michigan, March 1953; H. H. Ormand, "How Ford Selects Plant Sites," *American Business*, June 1946, pp. 12 ff.

[56] For a discussion of possible economic effects in the American automotive industry due to automation, *see*, John Robert Summerfield, *Some Economic Effects of the Development of Automatic Process Controls in American Industry* (Unpublished Doctoral Thesis, Berkeley: University of California, 1954), pp. 1-180; also, David G. Osborn, *op. cit.*

following World War II. Nor is there any portent that these trends will reverse themselves.[57]

So much for the economic factors in the locational policies of auto manufacturers. Just a word about the attempts of the national government and private industry to minimize atomic vulnerability in the age of the hydrogen bomb by a conscious strategy of dispersal. The inauguration of the National Industrial Dispersion Program by President Truman in 1951 sought to use accelerated tax amortization privileges as part of the defense contract program to encourage industry to locate new plants outside of defined target zones. The significance of the auto industry as a prime defense industry and its highly vulnerable nature have led the industry's executives to consider industrial dispersal as good business insurance where dispersal does not openly conflict with predominating economic goals.[58]

Summary and Conclusions

While substantially sound economic reasons existed for the birth and growth of the auto industry in and around Detroit, certain happenstance factors such as the local presence of inventors and men gifted with engineering genius also played a role. With the development of highways and such dependent industries as petroleum and steel, the industry grew into an "hour-glass pattern" whereby the manufacture and assembly of component parts became decidedly centralized in and about Detroit while the later operations of final assembly and distribution were scattered in order to reduce transport costs on a product which gained substantially in bulk and weight in the ultimate assembly phase.

Mass-production methods have led to widespread division of labor and specialization of function in all phases of the productive process. This together with dependence upon a large supply of skilled and unskilled labor and ready access to semi-fabricated materials, parts and accessories dictated the nucleated patterns of the industry in the productive stages leading up to final assembly. The policy of charging the customer f.o.b. Detroit freight rates on a fully assembled car while shipping "knocked-down" cars to regional assembly plants confirmed General Motors and Ford in a policy of maintaining a vast network of branch assembly plants.

Furthermore, the economies attaching to the principles of multiples, massed reserves and bulk transactions enable large-scale auto producers to reap the advantages of spreading lowered fixed costs over a great volume of finished goods. Without the economies of mass-production, concentration in the earlier production stages and oligopolistic features, it is doubtful if the industry could have succeeded in bringing the auto within the price range of the average American family. Only a giant producer can afford a policy of nation-wide branch assembly plants near regional markets, expensive automation and re-tooling programs for annual model change-overs, extravagant advertising campaigns and a vast arterial system of dealers under agreement to the factory.[59] Helping decen-

[57] For future prospects, *see*, "New Era Coming in Autos," *U. S. News & World Report*, June 13, 1958, p. 51 ff.; "Autos: A Market So Big You Can Drown in It," *Business Week*, February 6, 1954, p. 50 ff.; "Industry Studies Auto Styling as Key to Sell New Engineering," *Business Week*, November 10, 1956, p. 123 ff.; "The Small Car—What Are the Facts?," *U. S. News & World Report*, August 15, 1958, p. 64 ff.; and "What's Next in Autos?," *U. S. News & World Report*, May 2, 1958, p. 38 ff.

[58] Neil P. Hurley, "The American Achilles Heel," *National Defense Transportation Journal*, July-August 1956, p. 38 ff.

[59] *An Engineering Interpretation of the Economic and Financial Aspects of American Industry: The Automotive Industry* (New York: George S. Armstrong & Company, 1955); *The Automobile Industry* (New York: Merrill Lynch, Pierce, Fenner & Beane, 1953).

tralization trends in the auto industry is management's desire to settle in new regions where no tradition of labor strife exists, where workers are more content with their wages and where resistance to labor-saving devices is minimal.

Since motor vehicles render suburban living possible, the industry is contributing to its own decentralization by marketing a product which encourages industrialization and population of new regions, thus creating markets which eventually will exercise a locational pull on the industry itself. The overall maturing of the American economy in all regions, the rapid technological strides in the fields of chemical, electronic, atomic and solar energy, the radial growth of transport and communication lines all involve multiplier effects and economic chain reactions which are dissolving the traditional, deep-seated concentration of auto production in the Michigan area.[60]

[60] Automobile Manufacturers Association, "What's Next in Autos?" *A Chronicle of the Automobile Industry in America*, 1952.

Some Economic Aspects of the Aswan High Dam Project in Egypt

By RAGAEI EL MALLAKH*

THE Soviet loan of 400 million rubles to the United Arab Republic has refocused the attention of the world on Aswan. This city, an historic and picturesque tourist center on the Nile, is the site of the largest single irrigation and electric power project ever conceived.[1] While the project is motivated by economic considerations, these aspects have hardly received the attention they deserve and have been overshadowed by some of the political implications.[2] An attempt will be made here to deal with the economics of this important developmental feature of modern Egypt.

The project constitutes Egypt's main hope of broadening the narrow strip of Nile land in which the country has had to raise its food from time immemorial and of widening the base of its economy—which depends heavily on cotton—through diversification and by industrialization. At the present time the overriding problem is to raise more food. The population is growing at the alarmingly high rate of about 2.5 percent every year, while the gross national product increases at an annual rate of only 1.5 percent.[3] The results, and the implications for the future, are obvious. Egypt, for a considerable period in its history an important exporter of foodstuffs, is now increasingly dependent on imports of grain.[4] More land on which to raise food crops and more electric power to stimulate industrialization are the two goals in regulating Nile flow. The project becomes the key to present efforts to alleviate the pressure of population on land.

Description and Background

The proposed dam at Aswan has come to be known as the High Dam (*al-sudd al-'ali*) because it would be one of the world's tallest rock-fill structures. Its height above the Nile River would be 365 feet, the length of the dam itself 3.1 miles, and the reservoir thus created would hold 130 billion cubic meters of water. This would be the largest lake ever built, three times the size of Hoover Dam's Lake Mead in the United States. While the present control of the Nile has provided for seasonal storage of water within a twelve-month period and has permitted perennial rather than basin irrigation, the proposed dam is expected to provide "century storage." This control would allow a regular supply of water

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[1] The High Dam came into the news prominently in the summer of 1956 when the United States Secretary of State, John Foster Dulles, withdrew the American offer to aid substantially its building. This act was followed shortly by the nationalization of the Suez Canal. Since the Suez crisis, the High Dam project seemed to lie dormant. It was just in October of the year 1958 that initial construction work on the Dam was announced.

[2] *The Manchester Guardian Weekly* stated on Ocotober 30, 1958: "It is a tragedy that the Aswan Dam has become a political battle standard. For however eagerly President Nasser desires his 'pyramid' to glorify his regime the peasants of Egypt need it, or an equivalent scheme, still more urgently to improve their miserable livelihood . . . . Their yearning for a high dam is not of a piece of nationalistic megalomania. the use of the Nile is to Egyptians literally a matter of life and death."

[3] Republic of Egypt, *The Permanent Council for National Production Annual Report*, 1955 (Cairo, Egypt: in Arabic) pp. 10-11. Also, The Permanent Council of Public Services, The Economic Sub-Committee, *The Population Problem in Egypt* (Cairo, 1955:), p. 23.

[4] Egypt is a growing importer of grains. Imports of wheat alone in the year ending June 20, 1957, totaled 675,000 tons and consumption in the same year amounted to 2.3 million tons. Estimates of imports of the year ending June 30, 1958, were set at 1 million tons, and of consumption 2.4 million tons. See, International Monetary Fund, *Financial News Survey* (Washington, D. C.:) Vol. X, No. 19, November 8, 1957.

for reclamation and power, storing flood waters and that of years of high flow for use in years of relatively low flow.

Although the Aswan project had been discussed since the original plans were suggested in 1947 by Adrien Daninos, an Egyptian engineer to the Ministry of Public Works, the decision to transfer blueprints into action was taken in 1954. This was done after many preliminary studies on the project as well as on alternative proposals for a series of other projects including a third raising of the existing Aswan Dam (built in 1902) and the diversion of water into the Wadi al-Rayan depression. It became clear that the High Dam was more feasible technically and probably financially more advantageous. Background work included the drawing up of designs by a West German firm. These designs were approved by an international committee of consultants which, in turn, advised that Professor K. Terzaghi of Harvard University be consulted. The Egyptian Government sent a mission to the United States to meet with Professor Terzaghi, who gave his technical recommendations. The United States Operation Mission (International Cooperation Administration) in Egypt also assisted by providing aerial and ground surveys and mapping of the proposed reservoir. According to the latest designs, plans call for the construction of a rock-fill dam with a clay blanket to prevent passage of water beneath the dam, which would rest on alluvium. A grout curtain reinforced by the upstream blanket has also been proposed.

The site (about four miles south of the present Aswan Dam) has been found to be most suitable for more than one reason. Apart from its construction advantages, it is possible to secure adequate quantities of building materials cheaply. The famous Aswan granite quarries are nearby.[5] Also, the chosen site, in the utmost south of Upper Egypt, will regulate the Nile Flood for the benefit of the entire Egyptian Region.

It has been estimated that the installation of the new dam at Aswan would result in the retention of almost all of the 32 billion tons now lost yearly from the average annual flow, which is figured at 84 billion tons. As only 30 percent of the water retained would be lost by evaporation from the proposed reservoir, the net gain would be about 20 billion tons of water, to be shared between the Egyptian Region of the United Arab Republic and the Sudan.

The Sudanese, whose consent is necessary to carry out major irrigation projects under the 1929 Nile Agreement, have expressed reservations both to the site and their potential share of water. Among these are that the reservoir would flood more than one hundred miles of Sudanese land along the Nile, submerging the Nubian Valley and the town of Wadi Halfa. Another criticism is that loss by evaporation in the dry Aswan region would be greater than in sites nearer the sources of the river.

In the meantime Egypt has offered its southern neighbor compensation for the resettlement of the Nubians and 50 percent of the Nile water to be gained by completion of the project. Egypt also maintains that agreement on the High Dam would not preclude the Sudan's construction of its own irrigation projects.

[5] Granite is the most suitable construction material for such a project yet granite reserves are concentrated in the Aswan area and are not easily accessible elsewhere in the country. The difficulty in transporting granite has represented a constant problem in carrying out major irrigation projects on the Nile. And it might be interesting here to recall that obtaining granite blocks for a barrage near Cairo posed great difficulties for Egypt's ruler Mohammed Aly more than 115 years ago. To solve the transport problems the ruler ordered his workers to use the stone blocks of the nearby Cheops Pyramid but fortunately his French consultant engineers, aware of the historical value of this monument, advised him somehow of their preference to utilize "new" blocks.

The Sudanese have countered with a request for a water agreement prior to damming in order to avoid the wait of an unspecified number of years while the new reservoir filled. Also, they want to

proceed with the construction of the Roseires Dam on the Blue Nile, a project which requires Egyptian consent, according to the same 1929 Nile Agreement. The writer believes that, because of the strong cultural and economic ties which have survived and overcome many obstacles in the past thousands of years, and because both sides know that their own enlightened self interest will be furthered by cooperation, the two countries will join in finding solutions for problems that are, admittedly, not simple.[6]

Economic Benefits

To the Egyptian Region of the United Arab Republic the High Dam project means an addition of about 25 percent to the present national income, recently estimated at 856 million Egyptian Pounds.[7] The principal benefit will be a considerable increase in the arable land of Egypt. Figures vary, but it is calculated that 1.3 million acres would be added to the existing 6 million. The land to be reclaimed is largely sandy soil and is more suited to growing of food crops than to cotton, which requires a heavier soil.[8] Reclamation of the new area would begin during the construction period of some ten years. In the first five years of construction from 200,000 to 500,000 acres would be expected to be reclaimed; 200,000 acres during the following five years; and the remaining 600,000 acres brought into use after completion of the dam. The project would also make possible the conversion of 700,000 acres of basin irrigation to the perennial system. It would ensure as well an adequate water supply for rice production in some 700,000 acres of the existing irrigated area (instead of 400,000 acres in low-flood years under the present system of

[6] When the Sudanese government began diverting waters to start its Nile project in the summer of 1958, this government declared it was not bound by the 1929 agreement on the ground that the Sudan was subject to foreign administration at the time of the agreement.

[7] Estimates of the gain in national income are of necessity rough in nature. The Egyptian Minister of Finance put this gain at between 200 and 300 million Egyptian pounds (*Al-Ahram*, Cairo, November 23, 1956). The percentage estimate given above takes into account increase in agricultural income, incomes to be earned in industry and trade, indirect effects of provision of power, etc. This percentage increase might be reached in twenty years. (Egyptian pound = $2.87).

[8] *Egypt's News* (Washington, D. C.), January 4, 1956.

annual storage). Apart from the foregoing, Egyptian agriculture would be assured of a constant rate of water flow at all times, an important advantage not derived from existing reservoirs.

While providing full protection against flood and drought, this constant regulation of Nile flow by the High Dam would also lower the water table. Proper drainage is more important to Egyptian agriculture, and inadequacy of drainage facilities has been responsible for loss in yield amounting in some cases to an estimated 50 percent. Productivity of permanent crops such as fruit trees has been adversely affected. Expansion of fruit culture in the Egyptian Region would not only result in savings on foreign exchange now spent for imports but provide more profitable enterprise than many of the usual crops and help diversify agriculture as well. Modifying present drainage practices through regulation would enable the Egyptian Region to employ available water more effectively in oases, where it presently goes to waste and produces salinity problems. This water could be used in expanding pasture and forage crops which, in turn, could support increased animal husbandry.[9]

The dam would serve agriculture in providing cheap electric energy for machinery such as irrigation and drainage pumps. Wider use of electrically-powered machinery will have at least three important results: (1) cut down production costs and allow higher volumes than present techniques; (2) by replacing animal power, permit a major part of the land now used for cultivation of draft animal food (about one-eighth of the area) to be converted to production for human use, and (3) release dairy animals from the present necessity to perform farm work and thus raise their meat and milk production.

One challenge to Egyptian agriculture that would result from installation of the High Dam is related to precipitation of silt in the basin.[10] Loss to the soil of this invigorating element could be met, however, by the use of more fertilizers and greater care in farming practices. The dam itself would make possible the expansion of chemical fertilizer output through the increase in hydro-electric power.

In addition to these important benefits to agriculture, the project would aid the Egyptian Region in its quest for industrialization. Development should benefit from the relatively cheap hydro-electric power to result in about five years, or as soon as the coffer dam required in the process of construction is completed. Improvement of hydrological and operational conditions upstream from the existing Aswan Dam would mean that electric power generated from that Dam would be stabilized, providing an uninterrupted supply throughout the year of about 1.9 billion KWH. Estimates of the Permanent Council of National Production indicates that, after ten years of construction, total output of both the existing Aswan Dam and the High Dam's eight power units installed during that period could reach approximately 6 billion KWH. This power is planned to be distributed as follows: 1.8 billion KWH for fertilizer production, 0.9 billion for irrigation and 3.3 billion to be supplied to Cairo. During the second ten-year period of the project another 8 units would be added. The ultimate aggregate

[9] Dorean Warriner, *Land Reform and Development in the Middle East, A Study of Egypt, Syria, and Iraq* (London: Royal Institute of International Affairs, 1957), pp. 22-23.

[10] The amount of material to be precipitated behind the High Dam is estimated by the Permanent Council for National Production at 90 million tons per annum. At this rate it would take some 500 years for the capacity of the reservoir to be seriously affected.

output of the two dams would reach 10 billion KWH per year, with the High Dam accounting for 8.1 billion of this total. The Council also estimates that total Egyptian requirements of power will reach 5.8 to 6.5 billion KWH by 1965 and 11.8 to 13.5 billion by 1975 as compared with present consumption of 1.3 billion KWH.

Power to be gained from the High Dam would be used in fertilizer production, irrigation and drainage, for industry and for electrification of the railway system. Per capita consumption would ultimately be raised from 60 KWH to almost 400. These figures compare with present per capita consumption of 2,407 KWH in the United States, 1,427 in the United Kingdom, and 824 in France. Availability of electricity at the low figure of 0.5 millieme (equivalent to $.0144 per KWH as estimated by the Egyptian Permanent Council of National Production, would result in lowering the Egyptian Region's import requirements of petroleum products by some 2 million tons annually and a resultant saving of some 10 million Egyptian pounds in foreign exchange.

Construction works on the High Dam would considerably widen short-range employment opportunities. These would absorb several thousands of workers and aid in creating a skilled labor force available for future industrial development. Closely connected with this process would be the expansion of the steel, cement, and stone quarrying industries.

Mention has been made of expansion in the use of fertilizers both to reclaim land and offset silt losses. Egyptian farmers are already among the world's heaviest users but it is estimated that consumption of nitrogenous fertilizers will double in a five-to-eight-year period to some 1.3 billion metric tons. This figure includes a growing share of ammonium sulphate for rice expansion. Superphosphate consumption is also expected to double during the same period to about 0.3 billion metric tons.

The foregoing benefits are not all-inclusive. Navigation on the Nile, for example, would be improved by the regulation of water flow. The Egyptian Region would be spared flood losses and the effort and expenditure necessitated by flood precautions. It should be added, however, that, while the advantages to be gained from the High Dam far outweigh those of any other single project or combination of projects, the Dam is not a panacea for all of Egypt's problems with the Nile. Carrying out such schemes as the Lake Tana Dam (in cooperation with Ethiopia), the Jongeli Canal in the region of the *Sudd*, and the Lake Kioja and Lake Albert Dams on the Upper Nile would be consistent with and add to the benefits of the High Dam as well as increasing water supply by more than 10 percent.[11]

Costs and Financing

Among the many estimates being made on the ultimate cost of the project is that based on recent International Bank figures: 465 million Egyptian pounds. This would be divided into public investment of about 300 million Egyptian Pounds during the first ten years and some 40 million Egyptian pounds thereafter. The rest of the expenditure would be made from private funds and include costs of small irrigation canals, housing and resettlements on the newly reclaimed lands over the entire period. In the above estimate, about 30 percent of the total (or $400 million) would be required in foreign exchange to supply equipment and machinery from abroad.

But as the total annual capital formation in both public and private sectors of the Egyptian economy does not exceed

[11] M. Jungfleisch, "Pour mieux connaitre le Nil." *L' Egypte Contemporaine* (Cairo), No. 291, July 1955, pp. 38-40.

70 million Egyptian pounds, of which some 41 million Egyptian pounds go to construction works and another 18 million Egyptian pounds are spent every year on capital imports, it becomes clear that present resources for capital development are not adequate to finance the High Dam. This difficult situation will require a combination of measures to meet it. Among these are changes in allocations;[12] an all-out attempt to raise the level of local investment, an increase in local resources, and foreign loans and grants-in-aid.

The United Arab Republic has reached an agreement with the Union of Soviet Socialist Republics for a loan of 400 million rubles, or approximately $100 million, to cover almost one-quarter of the High Dam Project requirements of foreign exchange.[13] For the other three-quarters the United Arab Republic authorities have stated that the door is still open to the West for investment in this monumental project.

A glance at the Egyptian earnings of foreign exchange would show the necessity of foreign aid as well as economic austerity on the domestic front.[14] Revenue from the newly nationalized Suez Canal represents a fresh source of foreign exchange estimated at about 35 million Egyptian pounds a year, which totals about 20 percent of foreign receipts and one half of convertible currencies. But this will probably not be sufficiently adequate to bridge the widening gap created by the continuous decline in the war-accumulated sterling balances. In order to finance essential imports these reserves of 400 million Egyptian pounds were cut during post-World War II years by about 20 million Egyptian pounds a year. These withdrawals have reduced these reserves to a current 60 million Egyptian pounds. In addition one fourth of the Suez revenue has been pledged by the government of Egypt to be spent on maintenance and improvement of this vital waterway.[15] Egypt also has agreed to pay a sum of 23 million Egyptian pounds compensation to British shareholders of the former Suez Canal Company.[16]

The problem of foreign exchange has been intensified by Egypt's Five Year Plan of industrialization. This plan, embarked upon in 1957, requires the expenditure of 190 million Egyptian pounds. Only partial financing of this plan's foreign exchange requirement has been provided through the separate Soviet loan of 70 million rubles, agreed upon early in 1958.[17]

Regarding the impact which the Egyptian-Syria merger will have upon separate, or common foreign resources, an accurate assessment is likely to be

[12] United Nations Department of Economic and Social Affairs, *Economic Development in the Middle East, 1956-1957, Supplement to World Economic Survey 1957* (New York: United Nations Publication No. 58.11.C.2, 1958), pp. 16, 17.

[13] International Monetary Fund, *op. cit.*, Vol. XI, No. 22, November 28, 1958, p. 176.

[14] The President of the Board of the National Bank of Egypt, in his address at the Annual General Meeting in March 1958, stated: "Preliminary estimates based on approximate figures of last year's balance of payments show receipts of approximately 240 million Egyptian pounds and disbursements of about 270 million Egyptian pounds, leaving a deficit of some 30 million Egyptian pounds. This refers to both current and capital items and is another indication that our main efforts should be directed towards balancing external payments." The same point has been emphasized in a report of study group set up by the Egyptian Society of International Law, *Egypt and the United Nations* (New York: Manhattan Publishing Company, 1957), pp. 108-109.

[15] "Suez—A Canal and Financing Company," *The Egyptian Economic and Political Review*, (Cairo, Egypt), August 1958, p. 35.

[16] National Bank of Egypt, *Economic Bulletin*, Vol. XI, No. 1, (Cairo, Egypt), 1958.

[17] The agreement on Economic and Technical Cooperation between the Union of Soviet Socialist Republics and the Republic of Egypt stipulates that the credit shall be utilized during the period of four years from the date of entry into force of the agreement to pay for equipment, for geological exploration work, and for training of skilled personnel. Article 7 of the agreement provides that the government of Egypt shall repay part of the credit for each industrial enterprise in twelve equal annual instalments, one year from the date of completion of delivery from Union of Soviet Socialist Republics of complete equipment stipulated in corresponding contracts for each industrial enterprise. See, *The Egyptian Economic and Political Review* (Cairo, Egypt), May 1958, p. 45.

premature. However, it might be useful to indicate here that the current budget of the United Arab Republic shows an Egyptian contribution which offsets a deficit in the Syrian revenue.

Local requirements of the High Dam Project are estimated at 20 million Egyptian pounds for each construction year. It is clear that these requirements are such as to impose a heavy burden on the Egyptian Region's economy during this period. Government expenditures already exceed 25 percent of the national income. It will be extremely difficult to raise taxes or to introduce new ones without serious effect on individual initiative and the whole, private sector of the economy. More important to raise local funds would be the improvement of tax collection and the reduced tax evasions. Borrowing, too, will not be easy. The budget of the government for economic development projects represents substantial expenditures.[18] Expenditures alloted on an annual basis for the three years beginning with 1956-57 are, in Egyptian pounds:

	1956–7	1957–8	1958–9
Public Works	16.7	11.8	12
Petroleum Administration and Mineral Projects	2.5	2.1	4.0
Communications	12.5	9.1	13.3
High Dam	2.9	2.8	2.6
Other Projects	11.3	2.5	14.0
TOTAL	45.9	28.3	45.9

And public loans for these projects doubled from 25 million Egyptian pounds in 1955 to over 50 million Egyptian pounds in 1957.[19]

The sums for local financing must come out of larger available totals. The success of the program will depend on adoption of measures to expand and diversify exports, to encourage tourism and transit trade, and to restrict luxury imports and imports of products which can be produced economically in the United Arab Republic itself. To achieve these goals it will also be necessary to expand agricultural output, to encourage (rather than force) industrialization and to stimulate exploration for minerals.

It will also be necessary, during the period of High Dam financing, to pursue a rigorous policy to avoid inflation. The country will find it imperative to forego spending on schemes that might "look good" but are unsuitable for the country's actual conditions, or on projects which, while good in themselves, must be in terms of aggregate criteria relegated to a second order of magnitude. Such proposals as the construction of a subway system for Cairo, where subsoil conditions are unsuitable and maintenance would be excessively expensive, establishment of state-owned or controlled industries which would have to be protected by extremely high tariffs, are examples. Careful research on advance requirements, on present and potential resources and on the expenditure of Egypt's scanty resources in foreign exchange must precede action. Anxiety to reap fast political dividends must not be allowed to overcome prudence. Expansion in all sectors simply cannot be undertaken during the High Dam construction years. Changes in present allocations and the attempt to change present private investment habits (real estate, luxury apartment houses, etc.) must be made. It cannot be assumed that large foreign loans, Russian loans included, will be available to "bail out" the economy in case of serious inflation.

The Egyptian Region has already seen in its recent history an example of what unwise fiscal measures can do during a period of active development.

[18] Development Projects Budget, *The Egyptian Economic and Political Review* (Cairo, Egypt), July 1958, p. 38.

[19] United Nations, *Economic Developments in the Middle East, 1956-1957, op. cit.*, p. 12.

The construction of the Suez Canal cost Egypt 18 million Egyptian pounds, a large sum for those days, but not one outside its capabilities. But heavy expenditures on ostentatious and extravagant schemes undertaken during the construction period led to recurrent economic crises and eventual instability.

Conclusion

There is still a noticeable tendency in the Middle East to regard the High Dam as a "one shot" cure, not only for all the troubles of the Nile, but for all of Egypt's economic and social problems. Such is certainly not the case. These problems are complex and deep-rooted and the potential cure broader in scope and more basic. The great Egyptian problem is the increasing pressure of the population (recently estimated at 24 million) on the land—or more pressure on the six million arable acres. This provides a man-land ratio of almost four persons to the acre, one of the highest in the world. The High Dam at best would make possible an average annual increase of 100,000 arable acres for the following twenty years. The population is currently increasing at a rate of more than 500,000 annually and shows every sign of increasing even more rapidly. Thus there will be at least five additional persons for each acre reclaimed. Even the increase in electric power, per capita consumption of 400 KWH, or about 60 percent of the consumption of a non-industrial country such as Denmark, will be used according to present plans, to provide fertilizers and for electrification of the state-owned railways.

If the aggregate increase in national income does reach 25 percent, this does not mean that there will necessarily be an increase in real per capita income. Here we have sobering statistics to consider. During the fifteen-year period from 1938 to 1953 there was an increase in the real national income (at the 1939 price level) of 22 percent. But this boost in income was offset by the increase in population of a little under 2 percent a year. Per capita income declined from 10.2 to 9.5 Egyptian pounds, or by about 7 percent. With the current increase of 2½ percent in population the benefits of the High Dam will be negated during the 16 to 20-year period of its installation. So it can be said that in the final analysis the project will not improve the per capita economic situation in the Egyptian Region as much as it will prevent rapid deterioration. Other measures will be necessary for actual improvement.

A frequently mentioned measure to combat the problem of overpopulation is large-scale emigration to the Syrian region of the United Arab Republic. However, the immediate future cannot possibly realize a solution in the form of migration which can take place only in terms of the availability of employment and housing. It is to be noted also that planned emigration involves large costs, the greater share of which would necessarily be borne by the region of origin. Moreover, the traditional attachment of the Egyptian farmer to his land is a social characteristic which has continuously prohibited his emigration for milleniums. Two measures that may offer the most hope are in the fields of education—utilizing Egypt's largest resource, its manpower, in more remunerative, skilled operations, and secondly the "long shot" possibilities inherent in an expanded exploration of mineral resources in both regions of the United Arab Republic. In addition, anything that can be done to widen the market of the United Arab Republic through cooperative measures with other Middle Eastern "partners in distress" would be

fruitful of mutual benefit while not necessarily being antagonistic to the economic relations of other nations in the Middle East. Much thought should be directed in good faith to this possibility by all parties concerned.

Egypt and the Nile. Where the city of Cairo stands the Nile Valley opens out to form a triangular area, 155 miles from east to west and 100 miles from south to north—known since ancient times as "the delta." Once a broad estuary it is now one of the most fertile and intensively cultivated regions in the world thanks to the rich deposit of silt brought down by the Nile from the Abyssinian highlands. Seven branches of the Nile used to flow through it: but these have in the course of centuries been controlled and the river now has been diverted into two main streams flowing into the Mediterranean. The delta barrage, 16 miles north of Cairo, controls the water supply through the two main streams and the four principal canals of the network that covers the delta. The delta has a slope northward of 1 to 10,000 and is bordered on east and west by higher desert. The Nile alluvium when freshly deposited is very soft, plastic and sticky but, on losing moisture, it hardens into a tough earth; the roads in the delta are formed mainly of silt from the canals. In the delta the average thickness of the Nile mud is about thirty-two feet and the rate of increase has been calculated to be about three-and-one-half inches a century.

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Service on Limited-Access Highways: Organized Pressures and the Public Interest

By MILTON C. TAYLOR*

IT IS now certain that the future in highway construction points to controlled-access highways. This is true not only for the 41,000 miles of the interstate system but for much of the intrastate arterial system as well. In ten or fifteen years most states will offer the motorist a modern highway network roughly comparable to today's New York Thruway and Ohio Turnpike. Apart from the fact that these new highways will be toll free there will be only one other significant difference between them and the toll highways: whenever the motorist needs services, such as food or gasoline, it will be necessary to leave the right-of-way.

This method of providing highway services is a new departure, or at least new for extended stretches of controlled-access highways. In rough classification, highway services may be provided in three ways. Historically, private business could locate at any point on the highway. This practice ensures freedom of enterprise and service convenience for the driving public but detracts from the speed, capacity, and safety of the highways. Secondly, business establishments can be denied the right to locate on the right-of-way but service can be provided on the roadside under conditions of a natural monopoly supervised and controlled by public or quasi-public agencies. This procedure, developed in the wake of the toll highways, increases the efficiency of these facilities but is a restriction on private enterprise. Finally, a third alternative is proposed for the new interstate highway program: the limited-access principle but with the motorist being required to leave the right-of-way of the highway in order to obtain services. His needs will be provided by service facilities located at intersections or on feeder and frontage roads.

Since the limited-access principle is a firm and indisputable requirement of the new highway program and, for that matter, of much of the future state trunk-line system as well, there are actually only two alternatives available for the provision of highway services on the new limited-access highways: either they must be provided on a restricted monopoly basis on the right-of-way or be provided by unrestricted private enterprise off the right-of-way. The purpose of this article is to question whether it is good public policy to follow the present intention of denying services on the right-of-way.

The Present Policy

Raising the issue of the location of highway services constitutes resurrecting for examination a policy which has already been fairly well put to rest by statutory and regulatory provisions. It is also a problem which to all appearances has been happily resolved in the minds of most highway officials and spokesmen for industries with a particular vested interest in highway development. The immediate prologue to the statutory restriction of providing service facilities on the highway right-of-way is a policy "recommendation" in the Clay Committee Report:

"In constructing a controlled-access system, care must be exercised to insure that traditional free enterprise is promoted and that no monopolistic tendencies develop in the provision of needed facilities to serve the highway user with food, lodging, vehicle

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fuel and similar needs. This is a problem which requires careful thought and planning not only by Federal and State Governments but also by private industry serving the highways so that equitable plans may be developed taking local requirements into account."[1]

Statutory restriction followed in the Federal-Aid Highway Act of 1956:

"Such agreements (referring to agreements controlling points of access) shall also contain a clause providing that the State will not permit automotive service stations or other commercial establishments for servicing motor vehicle users to be constructed or located on the rights-of-way of the Interstate System."[2]

Subsequently, this statutory restriction was bolstered by administrative regulations:

"No signs (other than those specified in Section 1.17 traffic signs and signals), posters, billboards, automotive service stations or other commercial establishments for serving motor vehicle users, roadside stands, or any other private installations shall be permitted within the right-of-way limits; neither shall any portion of the rights-of-way be used in connection with any private business or undertaking. Exceptions to the provisions of this paragraph may be made under circumstances approved by the Administrator on portions of rights-of-way acquired for future use."[3]

There would appear to be general acquiescence on the part of highway administrators to these provisions.[4] Only 17 states have enacted legislative provisions dealing with services on the interstate system and 13 of these prohibit services on the right-of-way.[5] At the federal level no doubts of the advisability of the present policy (at least publicly expressed) have been voiced. Bertram D. Tallamy, Federal Highway Administrator, replied recently in an interview:

"Under the law, service facilities will be located off the right-of-way. I assume in the majority of cases they would be located on roads which have an interchange with the Interstate System, and motorists will have to go off the highway and get these services on side roads. That sounds pretty tough, but I'm sure it will not be too serious generally."[6]

In the meantime, considerable attention has been given to the ways and means with which the statutory and regulatory provisions can be implemented. Without going into the technical intricacies of the plans, the solutions most often discussed involve four alternatives: (1) the use of feeder roads; (2) the utilization of old sections of the interstate system as service roads; (3) the construction of parallel service or frontage roads; and (4) the establishment of service facilities adjacent to the ramps at interchanges.[7] Regardless of what combina-

[1] The President's Advisory Committee on a National Highway Program (Clay Committee), *A Ten-Year National Highway Program*, January 1955, p. 15. As finally enacted, the law has these noteworthy features: (1) A nation-wide system of expressways, designed to satisfy anticipated user demands for the next twenty years, will be constructed. (2) The total federal, state and local expenditure is likely to be in the neighborhood of one hundred billion dollars. (3) A unique method of financing will be set up which will link federal taxation with highway expenditures. (4) The federal government will assume ninety percent of the cost of the interstate system and, in addition, provide a sixty-percent increase in funds for the improvement of other federal aid systems. (5) The facilities will be constructed with complete control of access in order to protect the traffic capacity of the highways.

[2] Section 112, Federal-Aid Highway Act of 1956, 70 Stat. 384.

[3] Section 1.11 (c), *Regulations for the Administration of Federal-Aid for Highways*, effective February 21, 1957.

[4] For example, the American Associations of State Highway Officials devoted only one paper to a consideration of the problem at their 1956 annual meeting and omitted the subject in their 1957 meeting. Also, in the printed report of the 1957 meeting of the Committee on Roadside Development of the Highway Research Board, there is only one brief reference to roadside services. Opposition to the policy of denying services on the interstate system is limited to representatives of the toll highways, to the infrequent protest of a state highway official (see, in particular, a paper by Floyd J. Felty, "Location and Establishment of Road User Service Areas," *Proceedings*, American Association of State Highway Officials, 1956, pp. 47-60) and to a ringing popularized denouncement by Robert Moses, *Harper's Magazine*, December 1956, pp. 27-31.

[5] *The Problem of Service Facilities on Planned-Access Highways*, National Highway Users Conference, Inc., November 1957, p. 5.

[6] "'We Are Going All Right,' An Interview with Bertram D. Tallamy," *Highway Highlights*, March 1957, pp. 7-8.

[7] A good analysis of suggested solutions is given by Frank J. Felty, "Location and Establishment of Road Service Areas," *Proceedings*, American Association of State Highway Officials, 1956, pp. 47-60.

tion eventuates from these alternatives, however, the end result will be the same: the highway user of the completed interstate system under the present policy will not be able to obtain services on the right-of-way.

Rationale of the Policy

How the policy of denying service facilities on the right-of-way evolved is not easy to piece together from official and primary sources of information. The Clay Committee Report quoted above is ambiguous with respect to a policy recommendation, even though a policy position may be read into it. This uncertainty is evident from subsequent testimony of General Clay before Senate hearings:

"*Senator Thurmond:* Would there be any prohibition against the erection of filling stations or other commercial establishments along this road system?

"*General Clay:* Yes, sir, or on those parts of the system that were designated as controlled access, there would have to be limited numbers of filling stations and other service stations along the highway right-of-way itself. Otherwise, you would completely destroy the capacity of your road. It is my understanding that a controlled-access road provides almost double the vehicle capacity that a non-controlled-access road provides. We did not attempt to find the answer to that problem in our own report other than to say that here was a problem that required a great deal of consideration within the States because we think it is a State problem, in order to be sure that whatever system is used to determine who does build these filling stations and other facilities, it be done on a fair and equitable basis and not through the establishment of monopolies. However, large sections of the highway would not need that type and kind of control at this moment."[8]

Normally, when an explanation for Congressional action is desired, the primary source of information is the hearings before relevant Congressional committees. Incongruously, however, the provision of services was never an issue while the bills for a national highway program were under discussion in Congress. No one is on formal record as either a proponent or exponent of a particular policy. This development could have either of two explanations: that the problem was overlooked, or that there was a reluctance to bring the issue out into the open. The latter explanation may be closer to the truth in view of the fact that the location of service facilities is an issue of obvious private and social importance. Also, there is no question that certain groups, such as the petroleum industry, have had very firm and usually vocal convictions on the subject. At any rate, whatever the explanation, it is regrettable that a problem of such importance was dismissed without open debate and without bringing to bear research on its resolution.

If an explanation is to be offered for the present policy of denying services on the right-of-way, it must, of necessity, be in the realm of conjecture and should be interpreted in that light. First, considering the Bureau of Public Roads, it is possible that the Bureau's interest in obtaining universal and enthusiastic support for the limited access principle resulted in a reluctance to introduce any qualifications which might be contentious and militate against the acceptance of the principle. At the state level the assumption is tenable that some highway officials took the attitude that the administration of service areas was a burden to be avoided—that their job was to build highways and not to police gasoline stations and restaurants. It is possible that some state highway officials had not adjusted their thinking to the service needs of limited-access highways. Finally, anyone who was very anxious in 1956 to have

[8] *Hearings*, Subcommittee of the Committee on Public Works, United States Senate, 84th Congress, First Session, February, March, and April 1955, pp. 402-3.

expeditious and favorable action by Congress on the Federal Highway Program may well have taken the approach that the whole program might be jeopardized, or at least delayed, if any action was taken which would stir up opposition on the part of effective lobbying groups.

It is actually to these organized industry groups, capable of exerting considerable lobbying pressure, that it is necessary to turn for a statement of the case against service facilities on the right-of-way. Among these, spokesmen for particular oil companies and for the American Petroleum Institute are the most adamant and articulate.[9] Their thesis has three sequential steps: (1) competition has been an underlying force behind the tremendous economic growth in the United States; (2) enormous benefits have been reaped both by competitive enterprise and highway transportation through their mutual growth and interdependence; and (3) the best way to preserve this competition, and at the same time operate within the confines of the limited-access principle, is to bar all commercial establishments from the right-of-way.[10]

And while competition is the shibboleth, monopoly is the curse. It is maintained that publicly controlled-and-supervised service facilities run the gamut of monopolistic shortcomings: inefficiently designed service stations, overcharging of the public because the state has to build the stations, inconvenience to truckers because they are given inferior service as compared to passenger vehicles, delay in serving customers, denial of opportunity to small jobbers, prevention of brand choice on the part of consumers, etc.[11]

Two impressions are gained by reading this material. Although the criticisms of supplying services on the right-of-way are based principally on toll highway experience, there is a noticeable absence of supporting data or even of substantive arguments. Rather, the case is based largely on platitudes and vague generalities. Secondly, there is an exaggerated preoccupation with the self-interest of the petroleum marketers; conspicuous by its absence is any reference to the convenience of the motorist.

The Counter Argument

A statement of the case for the provision of highway services on a restricted basis and located on the right-of-way is weakened by a lack of empirical evidence. The reason is that no quantitative data have been developed (except to a minor degree mentioned later) which would either prove or disprove a case for services on the roadside. Nor has this article any fresh evidence of an empirical nature to present. The rebuttal, therefore, must be on a different level; and two approaches are possible. There is first a number of observations which can be made by postulating certain premises and following these to their logical conclusions. Secondly, and what is possibly more convincing, there is the whole operating experience of the toll highways.

Considering first some general presumptive agruments, it may be said that

[9] The National Highway Users Conference, Inc. has also adopted a position of avoiding "the monopolistic tendencies that prevail on some of the planned access highways in operation," See, *The Problem of Service Facilities on Planned-Access Highways*, National Highway Users Conference, Inc., November 1957, p. 3.

[10] For a development of this thesis, see *Tax Economics Bulletin*, May-June 1956, p. 1; and a series of articles in *Proceedings*, American Petroleum Institute, 1956, Section 2, Marketing, pp. 207-28. Although the policy of the American Petroleum Institute is against service stations on the right-of-way, this opinion is not shared by all state-level associations of the Institute or by all spokesmen for major oil companies. See, for example, the article by J. R. Reid, "Facilities for Service to Motorists on a Limited-Access Highway," *Proceedings*, Tenth Annual Ohio Highway Engineering Conference, 1956, pp. 201-5.

[11] See the series of articles in *Proceedings*, American Petroleum Institute, *op. cit.*, (1956).

limited-access highways can be rationalized principally on two grounds—that they promote speed and safety. They provide faster travel because they avoid the congestion of cities and the delay caused by traffic lights and stop signs, while they are safer because they eliminate roadside interference with traffic and crossings at grade. One can even go so far as to say that if the new highways did not provide faster and safer transportation there would be no point in building them. No evidence can be offered on the time that would be consumed in obtaining services on the right-of-way as compared to locations at intersections or on feeder roads but no one should question which method is superior in terms of economy of time.[12] From the highway user's point of view, convenience in the sense of ease of availability, with attendant savings in time, money, and harassment as compared to the alternative of leaving the right-of-way, is probably the single most important attraction of service areas located on the roadside.

In this connection, it may be observed also that the new interstate system is a dual purpose highway in the sense that an important justification for its development is defense. Should these highways ever be called upon to carry large quantities of men and equipment in a national emergency, the delay and inconvenience of having to leave the highway for services would appear to prejudice their military usefulness.

Service areas on the right-of-way also promote safety by giving drivers a readily available opportunity to stop and relax even though they may not be in need of a meal or require service for their automobiles. Proof of the need for these opportunities to stop and rest is found both in the recommendations of safety authorities and in the long-established precedence of providing rest areas on rural stretches of highways.

There is also a counterargument to the charge that the provision of highway services on a restricted basis and located on the right-of-way leads to monopolistic exploitation. To be sure, monopoly in the provision of goods and services is to be avoided in general because it results—in the absence of protective competitive forces—in the exploitation of consumers. However, there are conditions under which the sanctioning of a monopoly is actually beneficial to the public because it results in lower cost operations. This is precisely the reason, for example, why natural monopolies are sanctioned in the provision of utilities. While again no definitive proof can be offered it, appears entirely reasonable to assume that service areas on limited-access highways represent low cost operations. The two principal reasons for this is that these areas can be selected so that services will not be duplicated and the facilities can be built to take advantage of the optimum size of operation.

At the same time, just as the public is protected by regulatory commissions in the area of public utilities, service facilities on the roadside may be supervised and regulated so that the public is not exploited by monopoly sellers. Competitive bidding may be used to ensure that there is no favoritism or collusion in the awarding of contracts, and the prices and

[12] On this point the representatives of oil companies are somewhat schizophrenic. On the one hand, they feel compelled to justify their operating performance on the toll highways. It is observed with pride, for example, that the average service station located off limited-access highways requires 7 minutes to service a vehicle but that this time has been reduced to 3 minutes and 20 seconds on the New Jersey Turnpike. (J. E. Nidecker, "Motorist Service on Limited Access Roads," A Panel Discussion. *Proceedings* American Bridge, Tunnel and Turnpike Association, Inc., October 1957, p. 96). Before a different audience, however, it is argued that the selling of fuel on turnpikes results in confusion and uncertainty. (C. A. Petersen, "The History of Service Stations on Turnpikes," *Proceedings*, American Petroleum Institute, 1956, Section II, Marketing, pp. 207-10).

quality of services may be controlled by a public agency.

These safeguards, however, should not be viewed merely as a means of preventing exploitation of the consumer; of more importance, they are a means of ensuring that a reasonable amount of the earnings resulting from the provision of services redound to the benefit of the highway user. Since the interstate highway system will represent a tremendous investment of public funds it is desirable that the benefits from this investment should accrue to the highway user to the greatest degree possible rather than to the oil companies and their authorized dealers. State-owned and controlled service facilities make this sharing of profits possible between private enterprise and the public through rental income received from the concessionaires while at the same time the highway user is charged no more for services than if he had obtained them off the right-of-way. This rental income, in turn, means that the public obtains new highways at a lower cost than would otherwise be the case.[13]

Also relevant to this issue of monopoly versus free enterprise is that denying service facilities on the right-of-way cannot be defended on the argument that this policy will protect the business of existing service industries. The reason for this is that the greater part of the new limited-access highways will be constructed on new locations and therefore old established business often will be located too far from the new highways to service their users. Instead it will be necessary for new service industries to be developed adjacent to the new highways. Consequently, the public policy alternative that is faced on the greater part of the interstate system is whether the highway user will be served by *new* facilities constructed either on or off the right-of-way.

Toll Highway Experience

Some observers may question the basic assumption that there is a close parallel between toll highways and toll-free limited-access highways and therefore they deny that toll highway experience is helpful in resolving the administrative problems of limited-access highways. The differences between the two facilities, however, appear to be of minor degree. Both are constructed under the most advanced techniques of design and standards of construction; both have the same end objectives of providing the highest standards possible for safe, efficient, and high-speed travel; both operate through densely and sparsely populated areas; and both are built to satisfy the same users with the same demands for highway service. About the only difference of consequence between the two is that toll highways are invariably constructed on new locations, whereas it is anticipated that only about two-thirds of the interstate system will be relocated on new right-of-way. Even giving full allowance to this factor, we are still left with the conclusion that what represents good service for the highway user on the toll highways also constitutes the same thing for the eventual user of *the greater part* of the interstate system. Moreover, it may be added parenthetically that if toll highway experience is to be used to prove the undesirability of services on the right-of-way, as it often has, it is equally appro-

[13] Testimony of the effectiveness of this device to ensure that the benefits of public investment will be recouped in part by the public are the charges by representatives of oil companies that large royalties are obtained by state agencies and the concessionaires are being prevented from making a profit without "paying tribute to the state." If it were not possible to make a profit, however, there would be no bidding for franchises on toll highways, and experience shows that the bidding for contracts among oil companies is actually very spirited.

Also relevant in this connection is the fact that limited access highways without service facilities involve an important increment in land values at the access points. These increments are a pure windfall and better be saved for the public.

priate to use the same experience to present the other side of the argument.

As a point of departure in considering toll highway experience it is appropriate to present a brief and general outline of the prevailing practice in providing services on toll highways, for even on this level of discussion there appears to be some differences of opinion on what constitutes the facts. An awareness of these basic constants is also relevant because they represent, as a "package deal," the principal alternative to the provision of highway services off the right-of-way.

The general trend among most toll highways is for the authorities themselves to construct and lease the restaurant and service station facilities. Massachusetts and Pennsylvania depart from this procedure, however, allowing the concessionaires to invest in their own buildings. The trend toward the ownership of facilities by toll authorities may be accounted for by two arguments: that it results in higher income to the toll authorities and that it facilititates administrative control.

Although there is a general trend to contract with only one restaurant company for all operations on a particular toll highway, it is not unusual for agreements to be signed with a limited number of three to five oil companies. Monopoly in the case of restaurant services is justified, according to toll highway authorities, in order to ensure economies of size. Permitting more than one oil company, on the other hand, is defended on the desirability of promoting "competition," although it is an enigma how competition can be operative when all prices and the quality of services are closely regulated and the highway user's freedom of choice is severely restricted.

Contracts to oil and restaurant companies are conventionally let on the basis of open bidding with awards given to the highest bidder. Extensive preliminary screening, however, ensures that any of the eventual bidders will be able to give satisfactory performance. Restaurant bids are based on a percentage of gross receipts while oil companies bid on cents per gallon for gasoline and on a percentage of gross receipts for other income.[14]

Prices and quality of service for both restaurant and oil companies are closely regulated by toll authorities. The basic objective is to establish prices which will be competitive with those prevailing in the close vicinity of the toll highway. All service facilities are operated on a 24-hour basis although with skeleton staffs during slack periods.

Service areas are spaced at intervals of between 10 to 50 miles with the most frequent interval being in the range of 25 to 30 miles. Most of the areas are constructed in pairs or staggered on opposite sides of the highway in order that ingress and egress will be provided from the low-speed lanes of the highway. This practice is justified principally on safety grounds. The Kentucky Turnpike and the New Jersey Garden State Parkway, however, have constructed service areas in the center island between roadways without creating any apparent safety hazards.

Efforts are made to give service to the motorist which is at the same time expeditious, restful, and gauged to the needs of the highway user. The general philosophy is that the toll authority has the obligation to satisfy the needs of the "patron" in return for the payment of the toll. There are several manifestations of this philosophy. Restaurants often supply snack bars as well as higher-priced dining room facilities and there is a trend developing toward self-service. Oil com-

[14] As an illustration, on the New York Thruway restaurant bids may vary from 14 to 17 percent of gross income and gasoline bids from 6.91 to 8 cents per gallon of gasoline plus 10 percent on accessories.

panies maintain that they expedite service under the basic assumption that the motorist would not be on a toll highway unless he was in a hurry. The provision of clean and adequate rest room facilities, usually made a joint responsibility of restaurant and oil companies, is construed to be of high priority. Disabled vehicles are assisted by regular patrols, manned either exclusively by state police or with the assistance on some highways of authorized garage contractors.

Implications of Toll Highway Experience

The whole weight of judgment and experience of toll highway authorities supports the conclusion that services on the roadside of limited-access highways are an indispensable requirement for the highway user. These service areas are not inexpensive to construct; for those on the New York Thruway, for example, the total cost was approximately $24 million. Yet despite this cost, and the obvious reluctance on the part of toll highway authorities to incur it unless necessary, the issue of whether or not services should be provided apparently was never debated seriously when most toll highways were in the planning stage. In fact, a few toll highway administrators interviewed in the course of this research maintain categorically that the present policy of denying services on the interstate system will have to be changed. What all of this means is that the present policy on the interstate system runs counter to the experience and judgment of a host of engineers, public administrators, and investment counselors who have been responsible for administering various facets of limited-access highways in the United States for nearly 20 years.

By comparison, the results are very illuminating in those few instances in which services were not provided on extended sections of limited-access highways. The earliest experience was with the Merritt Parkway, in Connecticut where the original law prohibited access except at public road intersections. There were so many automobile breakdowns, however, that service stations were found to be mandatory for efficient operation of the highway.[15] Similarly, when the Ohio Turnpike Authority opened 22 miles in advance of the remainder of the highway and without providing services it is reported that there were 374 service calls, of which 253 were for out of gas, in the first month of operation.[16]

Further proof of the need for service facilities on the right-of-way is found in the favorable operating results of business concerns on the toll highway. If anyone is dissatisfied with these facilities, apparently it is not the public. On the New Jersey Turnpike toll revenues increased by 33 percent from 1955 to 1957, while concession revenues rose by 27 percent. During the same span of years, the New York Thruway experienced an increase in number of miles traveled of 85 percent, while gallons of fuel delivered to gasoline stations rose by the same percentage and patrons served at restaurants increased by 207 percent. Even more favorable is the increase in concession revenue on the New Jersey Garden State Parkway from 1956 to 1957 of 38 percent while total revenues rose by only 17 percent. The Pennsylvania Turnpike Authority has determined that it sells one gallon of gasoline for every 30 miles of travel, or about one-half of the gasoline used on the facility. Possibly because of the shorter distance of the New Jersey Turnpike the same ratio is one gallon for every 50 miles of travel.

[15] G. Albert Hill, "Merritt Parkway Service Stations," *American Highways*, April 1949, pp. 10-11, 14.

[16] J. R. Reid, "Facilities for Service to Motorists on a Limited-Access Highway," *Proceedings*, Tenth Annual Ohio Engineering Conference, 1956, p. 204.

The New York Thruway has also calculated that concession revenues represent a favorable return on investment. Using an average interest cost of 3 percent and an amortization period of 40 years, it was found that the *net* return on investment from each service area varied from 1.7 to 15.4 percent and that the average net for all areas was 7.85 percent.

From these favorable results it seems evident that the highway user has endorsed the principle of supplying services on the right-of-way. This endorsement appears especially certain and positive in view of the fact that most motorists traveling toll highways have the alternative, if they are so inclined, of satisfying their needs by a detour off the highway. The favorable results also appear to dispel the notion that motorists are brand conscious with respect to gasoline. If they are, toll highway users would leave the highway to obtain the brand of their choice.

Toll highway experience even seems to prove that services on the roadway are needed as much on urban as on rural sections of highways. Few of the limited-access highways of the interstate system are likely to traverse an area as densely populated as the one served by the New Jersey Garden State Parkway and few are likely to have, like this Parkway, 260 entrance and exit ramps and 35 parallel roads within 173 miles of roadway. Yet this toll highway has well patronized service areas.

Empirical Evidence and the Need for Research

Considering the importance of the issue being reviewed, there is an unfortunate lack of information. The data that may be obtained from toll highway authorities on the demand for service facilities are incomplete and generally not sufficiently comprehensive to be of much value. For example, the New York Thruway Authority has taken traffic counts in advance of service areas which provide the information that 20 to 30 percent of all traffic enters service areas. But these data are not available for the whole of the year or for all service areas. Similarly, the New Jersey Turnpike Authority has found that there is one meal served and 1.8 gallons of gasoline sold for each 100 vehicle miles of travel and that one-third of the gasoline used on the highway is sold at service areas. If all of these odds and ends of data were assembled the result would probably still lack breadth and depth.

The most comprehensive single study of service needs on limited-access highways was undertaken on the Ohio Turnpike.[17] This research project found that 20 to 30 percent of all motorists stopped at service areas on short trips of less than 50 miles. On trips of 70-90 miles, approximately 50 percent stopped; while the percentage of motorists visiting service areas continued to rise until practically all cars stopped on trips over 200 miles. For all vehicles and for the average trip of 70 to 90 miles, 34 percent stop for food, 28 percent for the use of rest rooms, and 21 percent to buy gasoline. Once on the turnpike the motorist tends to stay on until his trip is completed; on trips of around 225 miles, only about 1.5 percent of the motorists leave the highway to buy fuel, while 6 percent leave for food.[18]

There is a great deal of information in the Ohio report, but it still represents merely a beginning of the research that needs to be done. More information is desirable on the number of motorists

[17] *Use of Facilities on Limited Access Highways*, Technical Subcommittee of the Petroleum Industry of Ohio, September 1957. (Mimeographed)

[18] Compare this data with the empirically unsupported statement by C. A. Petersen, a spokesman for the oil industry, who refers to "motorists who avoid the turnpike journey by leaving the super-highway to seek and patronize industry stations located on the interchange. "The History of Service Stations on the Turnpikes," *Proceedings*, American Petroleum Institute, 1956, Section II, Marketing, p. 209.

leaving the highway for services relative to the number using service areas. These data need to be obtained for various distances of trips and for rural and urban segments of the highway. Tests could also be run to determine the time and cost involved in obtaining services off the right-of-way as compared to obtaining them on the roadside. Public reaction could be obtained in order to determine the preference of highway users. Comparisons may be made of prices and quality of services on and off the right-of-way. All of these areas of research should be undertaken in different areas of the country and on different types of limited access highways. Research of this magnitude would appear to be entirely justified when it is recalled that over $50 billion will be spent on the interstate highway system and the provision of services is an integral and important aspect of the efficiency and convenience of the system.

Disabled Vehicles

While this article has been concerned with the provision of food, gasoline, and rest room facilities, it is apparent that these requirements of motorists constitute only a part of the total operational problem of limited-access highways.[19] One other difficulty, aid to disabled vehicles, deserves at least brief mention because it is related to the provision of service facilities on the roadway and its resolution also raises the issue of the regulation and supervision of private enterprise.

Aid to disabled vehicles is a different problem than the physical location of service facilities, because a motorist with a disabled vehicle on a limited-access highway must be assisted regardless of whether service facilities are provided on or off the right-of-way. At the same time, however, the issue is related to the location of service facilities. For example, when service areas are located on the right-of-way, contracts to patrol the facility may be given to oil companies which have concessions on the right-of-way. Or again, the problem of disabled vehicles is related to the location of service areas because it is possible that the incidence of disablement will be lower when service areas are located on the roadside. This assumption is based on the argument that motorists would be less inclined to take a calculated risk of continuing their trips when they are low on gasoline or aware that their automobiles require attention if highway services were located on the right-of-way.

Aid to motorists in distress is a major activity of modern toll highways. Experience has shown that an appreciable number of vehicles run out of gasoline or have mechanical difficulty when the drivers are many miles from the nearest location where assistance may be obtained. Typical are the statistics of the New York Thruway Authority which in 1956 gave assistance to 66,540 disabled vehicles. Out of this total, 20,044 vehicles had run out of gasoline, 13,874 had tire trouble, and 13,000 required a tow.

The toll highways have resolved the problem by providing regular police patrols, which in turn make arrangements for the removal of the vehicles. But toll highway administrators have found that unregulated private enterprise cannot be entrusted to remove these vehicles. They have found not only that many firms lack experience, equipment, or adequate insurance, but that there is a general tendency for the garages to overcharge the public. As a

[19] One experienced observer believes that the new highways will present such an abrupt departure to conventional highways that it will be necessary for highway departments to establish an "operations division" which will include five sections: traffic operations, policing, communications, service, and maintenance. Charles M. Noble, *Proceedings*, American Society of Civil Engineers, May 1957, pp. 1249-1-12.

result, the standard procedure on toll highways is for only authorized garages to be allowed on the highways.

Even without going into the problem of disabled vehicles comprehensively, two tentative conclusions appear warranted. In the first instance, fast and efficient service for disabled vehicles appears to be necessary if the public roads are to approach the standards of convenience and safety developed on toll highways. Secondly, experience to date with extended stretches of limited-access highways shows that the problem of disabled vehicles can be resolved best through the combination of patroling by state police and the removal of vehicles by authorized and supervised garages.

Conclusion

There are three different interest groups involved in the provision of highway services on limited-access highways —the users of the highway, the suppliers of services, and the public road-building agencies. From the foregoing analysis, it seems apparent that the problem of providing services cannot be resolved under circumstances in which the solution will be mutually satisfactory to each of these groups.

If these delimiting observations are tenable, one further conclusion follows. The new limited-access highways are not being built for the Bureau of Public Roads, the petroleum industry, or the state highway departments. Therefore, it is not principally a question of what the engineers prefer, or whether the state highway departments would rather avoid the problems of administering highway services, or how the petroleum industry prefers to market its product. Nor is it a problem of free enterprise versus monopoly. Instead of all of these variables, the over-riding consideration is the maximum satisfaction of the highway user in terms of convenient, fast, and safe travel.

On the weight of the evidence available, it appears that this sovereignty of the consumer has been given scant attention in the process of reaching the decision that services should not be supplied on the right-of-way of the interstate system. Moreover, the present policy has been arrived at without due cognizance of toll highway experience. In the light of all of these circumstances, the very least that can be said is that a second look at the problem appears to be warranted.

Southern State Port Authorities and Florida

By ERIC SCHENKER*

Introduction

TO provide efficient management of the port's functions, public administration over port development is quite common today. This was not always the case, as evidenced by the historic fact that in 1910 the United States Commissioner of Corporations reported, "that private interests control nearly all of our active water frontage. Public control exists in considerable degree only at New Orleans, San Francisco, Baltimore, and New York, and is greatly modified at New York by exclusive private leases for long terms."[1] This lack of public control can be attributed mainly to the policy in the United States of encouraging private enterprise. The period of rapid expansion to the West and the growth of population created opportunities for the railroads, primarily, to establish facilities at the ports for the furtherance of their own interests. Little concern was given to the over-all coordination of this necessary link in the transportation system with the interests of the public, the welfare of the local and adjacent communities, or the national defense requirements.

The federal constitution in the "commerce clause" delegated to Congress the power to regulate commerce with the foreign nations and among the several states. In the absence of federal legislation, however, the states may institute certain laws for the commercial use of waters within their boundaries, even when such use involves foreign and interstate commerce.[2] Within its police powers the state has the right to regulate the speed and general conduct of ships and vessels navigating its water highways.[3] The state may, subject to the restriction that Congress has not enacted any conflicting regulations, establish harbor and wharf lines, mark the channels, control the movement of vessels in its harbors,[4] establish and regulate ferries, regulate pilotage,[5] and pass quarantine and sanitary laws pertaining to traffic within its boundaries.[6]

Influence in port affairs by the federal government through funds extended upon harbor and river improvements has been extensive. The policy announced in the federal rivers and harbors act of March 2, 1919, had a profound effect upon the creation of public terminals:

"It is hereby declared to be the policy of the Congress that water terminals are essential to all cities and towns located upon harbors or navigable waterways and that at least one public terminal should exist, constructed, owned, and regulated by the municipality, or other public agency of the State and open to the use of all on equal terms, and with the view of carrying out this policy to the fullest possible extent the Secretary of

* Department of Economics, Michigan State University, East Lansing, Michigan. The writer recently completed an investigation of a group of southeastern states in order to determine the necessity and feasibility of establishing a state port authority for the state of Florida. This investigation included: the historical and legal development of state port authorities in the states competitive with Florida; the purpose of the authority in each state; an analysis of the traffic passing through the ports; a survey of improvements in terminal facilities and services; an examination of the port's financial performance to ascertain if the ports are meeting their financial obligations; a consideration of the amount of business attracted or created in the form of new industrial plants and otherwise; and a survey and analysis of conditions in the state of Florida. The writer wishes to thank Dr. R. W. Bradbury, University of Florida, for his help in completing this investigation.

[1] Commissioner of Corporations, *Report on Transportation by Water in the United States, Part III, Water Terminals* (Washington: Government Printing Office, 1910).

[2] *County of Mobile & Kimball*, 103 U. S. 691 (1880).

[3] *The W. H. Beaman*, 45 Fed. 125 at 128 (1891).

[4] *County of Mobile & Kimball*, 102 U. S. 691 at 702 (1880).

[5] *Cooley & Beard of Wardens of Port of Philadelphia*, 12 Howard 299 (1851).

[6] *Morgen & Louisiana*, 118 U. S. 455 (1886); *Minnesota Rate Cases*, 230 U. S. 352 at 406 (1912).

War is hereby vested with the discretion to withhold, unless the public interests would seriously suffer by delay, monies appropriated in this act for the further improvement of existing projects, if, in his opinion, no water terminals exist adequate for traffic and open to all on equal terms, or unless satisfactory assurances are received that local and other interests will provide such adequate terminal or terminals."[7]

In addition to the policy of the federal government of encouraging public facilities at ports, the demands of the commercial, industrial, and trans-shipment interests at the ports stimulated port development activities to attract additional marine commerce to a specific water terminal area. These activities require a centralized body to direct, guide, and control the various phases of port operation.

There are arguments favorable to a local municipal administration over port matters. Likewise, the importance of ports and terminals to the shipping public of a large tributary area suggests that the port is in large degree a matter of state interest. Further, the important place of marine terminals in the national economy and defense requires some promulgation and enforcement on the part of the federal government. Whatever the level of public control, the necessity is recognized for some degree of public authority in providing leadership and effective coordination in port development.

During the last decade the number of state port authorities in the seacoast states which are competitive with Florida has increased from two to five. The Port of New Orleans has been under state control since 1896. Mobile, Alabama, was placed under a State Docks Commission in 1923. South Carolina organized a State Ports Authority in 1942 and North Carolina and Georgia adopted port administration at the state level in 1945. In view of the rapid rate at which port administration at the state level has grown in recent years, an investigation and analysis of the necessity and feasibility of a port authority for the State of Florida would seem important and timely.[8]

Southern State Port Authorities

The Board of Commissioners of the Port of New Orleans was created in 1896 and consists of five members who reside within the port limits. They are appointed by the governor from nominees submitted by five leading businessmen's organizations of New Orleans. Tenure of office is so arranged that one man retires annually. Members may not succeed themselves and they serve without compensation.

Jurisdiction of the Board of Commissioners extends over the port area in the vicinity of the city of New Orleans and includes power over construction, maintenance, operation and safety of all private and public port facilities.

During its half century of operations the Board of Commissioners has rebuilt the entire water-front facilities at New Orleans. The Board owns or controls forty-one wharves which extend over 7.56 miles of water-front and which are supported by transit sheds providing 5,651,570 square feet of covered storage area. Specialized services for the shipping public are provided by the Public Grain Elevator which has a capacity of 2,622,000 bushels; the Public Commodity Warehouse, consisting of eighty-six acres of which 22.3 are under cover; Foreign Trade Zone No. 2, an area where commodities from foreign coun-

[7] Act March 2, 1919, c. 95, sec. 1, 40 *Stat.* 1286; 33 U. S. C. A., sec. 551.

[8] Eric Schenker, *A Port Authority for the State of Florida*, (Publication No. 24,356, University of Florida, Mic 57-3973).

tries may be unloaded, sorted, stored, and reshipped without custom inspection or payment of duty; and the Inner Harbor-Navigational Canal, a five-and-one-half-mile canal connecting Lake Pontchartrain and the Mississippi River. This waterway has opened 100,000 acres of level land for industrial development. Private industries with an assessed value estimated at fifty million dollars have located in the industrial area.

The Board of Commissioners has the authority to borrow the money and to issue notes and bonds up to the sum of thirty-five million dollars. This amount is exclusive of the Navigation Canal for which an additional amount of twenty-five million dollars was authorized. Total bonded indebtedness is an obligation of the State of Louisiana. The amount of bonds issued totals $44,712,000, of which $14,416,023 were outstanding as of June 30, 1955. The debt has not been serviced entirely from operating revenues or the surplus accumulated. Since 1930 the Board has been allocated nine-twentieths of one cent of the state gasoline tax which is, in reality, a type of state appropriation. This allotment amounted to approximately $35,000,000 up to 1956.

Since the Board of Commissioners of the Port of New Orleans proved successful in the eyes of the state legislature, the Baton Rouge Port Commission was created in 1952. It is too early to determine the economic feasibility of this Commission but it is interesting to note that the State of Louisiana has two port authorities with independent duties and commissioners.

In 1923 the State of Alabama created the State Docks Commission and subsequent legislation changed the name of the Commission to the Alabama State Docks Board. Five members, representing the northern and southern section of the state, are appointed by the Governor with the advice and consent of the Senate. Nominations are submitted by the incumbent members of the Board. Members may not serve more than one ten-year term of office. Compensation of twenty-five dollars per day actually worked plus expenses is paid to the Board members.

Jurisdiction of the State Docks Board extends over the harbor and shore facilities located at Mobile, the state's only seaport. During its years of operation the Board has acquired a water-front area of six hundred acres, of which all but thirty-five acres are in use. The physical plant has been rebuilt to provide berthing space for twenty-five deep-draft vessels simultaneously. General cargo wharves operated by the state Docks Board have over one and one-half million square feet of transit sheds. Public warehouse space of 472,264 square feet of dry storage and approximately 531,000 cubic feet of cold storage has been constructed. Auxiliary facilities include the Terminal Railway Alabama State Docks; the Bulk Materials Handling Plant; a privately-financed grain elevator of 1,500,000 bushel capacity; a flour-blending plant, a sacking plant, and a bonded cotton warehouse.

In the Act of 1923, the state of Alabama provided for a bond issue of ten million dollars to promote, develop, and operate the harbors and seaports of the state. The state guaranteed the bonds in event that revenues, after payment of operating expenses, were insufficient to cover interest and principal payments. The state has paid a total of $4,808,902 of this indebtedness. The Docks Board has contributed to the payment since 1929 and it assumed full responsibility for debt service in 1952. The accumulated surplus of the Board is large enough to reimburse the state for the accumu-

lated debt service. The Board is keeping the debt as a liability since no interest has to be paid.

Concern over the decrease in waterborne commerce through the state's ports led the General Assembly of South Carolina to pass legislation in March 1942, forming the South Carolina State Ports Authority. Five members are appointed by the Governor with the advice and consent of the Senate for a term of seven years each, or until their successors are appointed. One member must reside in Charleston County, one in Beaufort County and one in Georgetown County, the sites of the state's three major seaports.

Although jurisdiction of the State Ports Authority extends over all the seaports in the state of South Carolina, actual operation of facilities is restricted to the Port of Charleston. Assistance was given to Georgetown and Beaufort in obtaining federal appropriations for dredging a deep-water channel to the Atlantic Ocean. In 1954 the General Assembly passed an Act creating the Port Royal Authority and giving this body of local leaders jurisdiction over the development of Beaufort.

Prior to formation of the Charleston Harbor Commission in 1920, the railroads and other private interests developed the water-front facilities at Charleston. The Charleston Harbor Commission purchased the Columbus Terminals and leased the World War I Army Quartermaster Depot and thus provided public facilities at the port. During World War II the Depot was used and modernized by the United States Army as a Port of Embarkation. In 1947 these facilities were returned to the city which transferrred title along with the majority of the municipal facilities to the State Ports Authority. Thus, without cost, the Authority became owners of a major shipping establishment which provided five ship berths with 744,000 square feet of headhouse and warehouse storage space at the former Port of Embarkation, the Columbus Street terminals, Union Piers No. 1 and 2, and the Union Public Warehouse. The entire establishment provides eleven berths, 233,700 square feet of transit sheds and 922,883 square feet of warehouse storage area. Auxiliary facilities include a terminal railway and a Vacuum Fumigation Plant.

Authority to issue bonds payable solely from net revenues was given to the South Carolina State Ports Authority. No such issues have been made. The earnings statement for the period 1943 to 1955 indicates that expenditures have exceeded operating income each year. Since 1943 the Authority has received $2,737,954 in state appropriations and this does not include the $280,000 for the fiscal year 1956.

The general Assembly of Georgia established the Georgia Ports Authority in 1945 to develop the port facilities of the state and to stimulate shipments of freight through ports. The Governor appoints the three members of the Authority for a term of four years. Members may be reappointed. They serve without compensation other than expenses incurred.

Jurisdiction of the Authority extends to all seaports of the state. However, emphasis has been placed upon acquisition of operating facilities at Savannah and Brunswick. Local control of port facilities is vested in the Savannah Port Authority and the Brunswick Port Authority.

The water-front facilities at the Port of Savannah were developed by the railroads principally to handle the local hinterland products, cotton, lumber, and naval stores. With the decline in ship-

ments of these commodities the railroads allowed their property to decline in usefulness. The Savannah Port Authority, formed in 1923, was unsuccessful in developing public facilities for handling general cargo. In 1948 the state of Georgia purchased from the federal government property and buildings known as the Savannah Quartermaster Depot for $808,100. Title to this warehouse facility, consisting of some two million square feet of storage area and an accompanying two hundred acres suitable for developing industrial sites, was transferred one year later to the Georgia Ports Authority. Subsequent construction at this location provided a marginal wharf with berthing space for four liberty ships and three covered transit sheds providing approximately 207,000 square feet of space. No facilities have been constructed at Brunswick or other ports within the state.

The Georgia Ports Authority has authority to issue revenue bonds. In 1951, to finance additions and improvements at the Authority's warehouse site, a bond issue of $5,500,000 was made. These bonds are payable solely from revenues of the Ports Authority and do not constitute an obligation of the state of Georgia.

The North Carolina State Ports Authority was created by a legislative act in March 1945. The Authority consists of the Director of the Department of Conservation and Development and eight men, appointed by the Governor and selected so as to represent the various sections of the state as well as the business, agricultural, and industrial interests. The normal term of office was established at six years, or until a successor is appointed. Members serve without compensation except for actual expenses incurred.

The jurisdiction of the North Carolina State Ports Authority extends over facilities owned or operated at the ports of Wilmington, Morehead City, and Southport. A state Board of Commissioners of Navigation and Pilotage has jurisdiction over examinations and licensing of pilots and other matters concerning pilotage on the Cape Fear River.

No public facilities existed at Wilmington or Morehead City suitable to handle water-borne commerce when the State Ports Authority was established. A state bond issue in 1949 provided seven-and-one-half-million dollars to construct modern terminals at these ports. Construction at Wilmington was completed in September 1952 and provided a marginal wharf 1,510 feet long and 200 feet wide, with berthing space for three ocean-going vessels. The dock supports two transit sheds with a total of 158,000 square feet of covered space. A warehouse was built which has 89,000 square feet of storage space.

The Authority completed construction of terminal facilities at Morehead City in August 1953, which included berths for five deep-draft ships at a concrete marginal pier, two transit sheds with a total of 92,000 square feet of covered area, and two warehouses which provide 88,000 square feet of storage space. The financial support of the Authority by the state is evidenced by the bond issue in 1949 for construction of facilities at Wilmington and Morehead City. No financial statements are available for the brief period of operations.

The State of Florida

The state of Florida has no state ports authority even though it is surrounded by states with such organizations. Florida is a maritime state with 17 ports of which the ports of Tampa, Jacksonville, Port Everglades, and Miami handle

the greatest amount of the water-borne commerce. The remaining ports are Apalachicola Bay, Canaveral, Carabelle, Charlotte, Fernandina, Fort Pierce, Key West, Palm Beach, Pensacola, St. Joe, St. Augustine, and St. Petersburg.

Though the state of Florida has no state ports authority, ten of its ports have local port authorities. The local authorities have the powers customarily held by such organizations, including the right to acquire property, to construct and operate port facilities, and to raise funds for port purposes. To meet their financial needs many of the local port authorities have issued revenue bonds and levy and collect a special benefit tax upon all taxable property within their port district. One might state at this point that taxpayers in the state of Florida are paying as much or more to support their ports as the taxpayers in states which do have a state port authority.

The ports which do not have a local port authority or those in which the local port authority does not take an active interest in port operations, are under the administration of their respective municipal government. The municipal government administers and participates in port operations by operating municipal terminals.

Before one can discuss the necessity and feasibility of a port authority for the state of Florida a few generalizations are necessary. The purpose of increasing the amount of water-borne traffic through their respective ports is common to each state port authority in the seaport states of the South. No universal standard, in fact no individual standard, has been established for measuring the success or failure of this purpose. The five states have, by the authority granted, indicated that public ownership and operation of piers, docks, wharves, transit sheds, warehouses, and auxiliary facilities are considered essential to attracting water-borne commerce to the port. Further it is held that increased trade will create business which will benefit the state.

Each state authority has developed modern facilities and has improved trans-shipment facilities in the seaports of the respective states. The completeness of these terminals varies, depending upon the length of time the body has been in existence and the amount and type of cargoes anticipated. The degree of success or failure of the state ports authorities in increasing the amount of cargo handled at their facilities cannot be categorically stated. There are many factors beyond the control of the authorities and the state which affect the amount of traffic moving by water. Federal policies, wars, crop failure or abundance, population changes, and many other factors enter into the over-all picture of commodity movements.

The acts of the various state legislatures do not specifically require that the activities of port authorities be financially self-sufficient. However, with the possible exception of the state of Louisiana, the implication is clear that the revenues obtained from the operation of port authority's facilities are expected to pay operating and maintenance costs plus interest and retirement of principal on bonded indebtedness.

The authorities have received assistance through federal government's policy of aiding, developing, and maintaining rivers and harbors. They have received support in the form of bond issues that are state obligations and in the form of physical facilities constructed by funds other than those charged to the authority. One must keep in mind that a state sponsored enterprise must receive the assurance of financial support of the state. That the state may have to absorb deficits in one enter-

prise is no indication of an over-all loss to the state. The gains to the public and the state from modern efficient water terminals have not been measured by this study. That such benefits exist, there is no doubt. Increased trade creates business. Increased business is beneficial to the economic well-being of the state.

One can only conclude from the facts studied that the ports in the state of Florida are at a distinct disadvantage in relation to other southern ports, since there is no central promotional agency. Other competitive states are supporting their ports with financial and promotional assistance. In connection with promotional support the activities of the Board of Commissioners of the Port of New Orleans can be used as an example; agencies of this organization are located in Chicago, New York, St. Louis, and Washington to assist and to solicit shipments to and through the port.

The state of Florida must establish a state port authority if it is to keep pace with its competitors. One can say that the surrounding influence of the other state port authorities is one of the reasons why Florida should adopt a state authority type of port administration.

Before one can continue the discussion of the necessity and feasibility of a port authority for the state of Florida the problems of hinterland and freight rates have to be discussed. By hinterland is meant the ports' back country consisting of three important areas: the local non-competitive area; the tributary territory for which because of proximity and consequent lower costs, the port forms a natural outlet; and the competitive territory, an area sufficiently distant so that inland transportation costs to other ports influence the shipper. As one might suspect, due to Florida's shore line and shape, the non-competitive territory and hinterland of each of its ports is relatively small.

The above definition should indicate that the narrow peninsular shape of Florida and its numerous ports provide further justifications for a state port authority. In reference to the problem of hinterland, it would be the duty of the authority to perform economic investigations and studies in connection with the determination of benefits that would accrue from the improvement of the various ports. These studies would include the determination of the non-competitive area of each port, port capacity estimates, population projections, and other related economic factors that could reasonably be expected to have bearing upon the considered improvement. The proposed authority would consider the effect of any projected, considered improvement on the entire state as well as the local area.

The second problem relates to the freight-rate structures of the country, developed on regional bases years ago. The railroads serving given regions or territories worked out rate structures with which they were willing to operate. Five major rate territories are recognized and these are Official Territory, Southern Territory, Southwestern Territory, Western Trunk Line Territory, and Transcontinental Freight Bureau Territory. Florida is in Southern Territory.

The transportation of traffic from place to place outside of switching districts is known as line haul. There are two main types of line haul rates, namely, class rates and commodity rates. Class rates are the rates which apply to the limited number of classes of freight into which many articles are grouped by the freight classifications or by the exceptions thereto. Commodity rates are rates published on specific commodities directly instead of through the medium of freight classifi-

cations. Commodity rates are published on specific commodities directly instead of through the medium of freight classifications. Commodity rates are generally lower than class rates on the same article. Most of the tonnage of the country, particularly of low grade commodities, moves on commodity rates. An analysis made by the Interstate Commerce Commission showed that, of the carload traffic originating on all railroads in this country, approximately 15 percent moves on class rates and 85 percent on commodity rates.

Class rates and commodity rates are in turn broken down into two further classifications, the export-import rate and the domestic rate. Export-import rates apply to rail traffic to or from American ports on commodities which make up our foreign commerce. For competitive purposes these rates have been largely equalized for ports within certain competitive areas to enable these ports to compete for available traffic. Such ports constitute a port group. This equalization has also been applied as between port groups. Miami is included in the South Florida group of ports along with Tampa, West Palm Beach, and Port Everglades. Jacksonville is included in the South Atlantic group which contains Savannah and Charleston. The group of Gulf ports includes New Orleans, Pensacola, and Mobile.

On account of the widely separated geographical location of the ports of Florida only Jacksonville is included in the South Atlantic group and thus is competitive with Savannah and Charleston. Most other Florida ports are in the South Florida group which takes on arbitrary rates 9 to 35 cents higher than the Jacksonville, Florida, rates. Thus the ports in the Gulf and South Atlantic groups have a distinct freight rate advantage over the ports located in the South Florida group. This fact along with a relatively small hinterland places most of the Florida ports in a precarious position.

With the above facts in mind, and after analyzing the geographic position of Florida ports, one can conclude that some of the ports in the state of Florida are being developed without economic justification and others which have economic justification are not being developed. This situation is the second and most important reason why the state of Florida should have a port authority.

The east coast of the Florida peninsula is the area where some port development has been carried on or is contemplated without economic justification. The ports of Jacksonville, Canaveral, Fort Pierce, Miami, Port Everglades, and Palm Beach all have asked the federal government to improve their respective harbors and all expect to expand their facilities. As one may recall, all the above ports, except Jacksonville, are located in the South Florida freight-rate group and have relatively small hinterland. This means that the ports in the South Florida rate group are competitive and are using part of the same tonnage to justify their expansion programs. It is not the purpose of this paper to determine which expansion program is justified, but the facts are clear that, if all the programs are carried out, there will not be enough traffic to make them self-sustaining.

A state ports authority could solve the following problems for the taxpayers of Florida: prevent the overexpansion of port facilities in one area; remedy the shortsightedness of a port; prevent harmful competition among Florida ports; and provide a sound promotion program for the Florida ports.

Statistical Indicators

Table I summarizes tonnage data of the major ports considered in this paper.

TABLE I—Gross Water-Borne Commerce and Percent of Net United States Total Water Borne Commerce for Selected Southern Ports: 1930, 1935, 1940, 1945, 1950, 1955
(*short tons millions*)

	1930	1935	1940	1945	1950	1955
United States Net Total Water-Borne Commerce	520,280	453,331	607,900	618,960	820,584	1,016,136
Mobile, Alabama						
Gross Total Water-Borne Commerce	4,056	3,556	4,951	4,287	7,233	45,083
% of U. S. Total	.78%	.78%	.81%	.69%	.88%	1.48%
New Orleans, Louisiana						
Gross Total Water-Borne Commerce	12,723	12,919	19,756	25,205	35,125	47,083
% of U. S. Total	2.45%	2.85%	3.25%	4.01%	4.28%	4.63%
Charleston, South Carolina						
Gross Total Water-Borne Commerce	2,520	2,010	2,262	3,818	3,428	4,346
% of U. S. Total	.48%	.44%	.37%	.62%	.42%	.43%
Savannah, Georgia						
Gross Total Water-Borne Commerce	2,270	2,876	3,880	2,479	3,471	4,220
% of U. S. Total	.44%	.63%	.64%	.40%	.42%	.42%
Wilmington, North Carolina						
Gross Total Water-Borne Commerce	1,258	1,389	2,583	1,047	4,022	3,384
% of U. S. Total	.24%	.30%	.42%	.17%	.49%	.33%
Jacksonville, Florida						
Gross Total Water-Borne Commerce	3,497	3,021	3,113	2,806	4,159	6,475
% of U. S. Total	.67%	.64%	.51%	.45%	.51%	.64%
Port Everglades, Florida						
Gross Total Water-Borne Commerce		262	739	1,650	1,867	3,342
% of U. S. Total		.05%	.12%	.27%	.23%	.33%
Miami, Florida						
Gross Total Water-Borne Commerce	982	1,046	1,832	1,672	2,168	2,881
% of U. S. Total	.19%	.23%	.30%	.27%	.26%	.28%
Tampa, Florida						
Gross Total Water-Borne Commerce	3,851	3,446	3,954	3,385	7,517	10,656
% of U. S. Total	.74%	.76%	.65%	.55%	.92%	1.05%

Included in Table I are the following items: list of ports; net water-borne commerce of the United States for selected years; gross water-borne commerce of the listed ports for the years; and percent of the total United States water-borne commerce handled by the respective ports. Net total water-borne commerce figures are used for the United States since gross figures would double-count domestic shipments. Percentage of United States total water-borne commerce is used as an indicator to show the respective position of the ports studied in relation to the total water-borne commerce handled by other ports.

The state of Louisiana created the Board of Commissioners of the Port of New Orleans, the oldest state port authority considered in this paper, in 1896. As indicated by Table I, the Port of New Orleans ranks first among the ports considered in percentage of United States water-borne commerce handled. Since 1930 New Orleans' percentage of total United States water-borne commerce has increased by 89 percent which is second only to that of Mobile, Alabama, which showed a 90 percent increase. In 1923 the State of Alabama created the State Docks Commission and subsequent legislation changed the name of the Commission to the Alabama State Docks Board. As indicated above, the Port of Mobile ranks first in percentage increase of total United States water-borne commerce.

Since 1942 the states of South Carolina, Georgia, and North Carolina have passed legislation creating state ports authorities. Each state hoped to duplicate the success achieved by Alabama and Louisiana. Table I indicates that this is not the case. Since 1930 Charleston, South Carolina, has shown a 10 percent decrease in the percentage of total United States water-borne commerce handled; Savannah, Georgia, a 5 percent decrease; and Wilmington, North Carolina, a 38 percent increase. One must note that this cannot solely be used to determine the success or failure of these new state port authorities.

The four major Florida ports, operating without a state port authority, showed the following changes in their percentage of total United States water-borne commerce handled from 1930 to 1955: Jacksonville a 4 percent decrease; Miami a 47 percent increase; Tampa 42 percent increase; and Port Everglades, even though it did not handle any major tonnage in 1930, handles at present a greater percentage of United States Commerce than Miami. This tonnage analysis alone could not be used as a justification for a state ports authority for the State of Florida. But Table I, combined with the data presented in Table II and Table III, does present evidence of the need for a port authority for the state of Florida.

Table II, showing the population growth in the states considered in this paper, indicates that Florida has moved from last to second position in total population. This means that Florida has moved ahead of Alabama, Louisiana, South Carolina, and Georgia. Florida has also had the greatest percentage increase in population in all the years considered. Retail sales volume for selected years for the six states under consideration are shown in Table III. Florida has moved in retail sales volume from fourth to first place. This places Florida ahead of Alabama and Louisiana whose major ports showed the highest percentage increase in all the years considered.

These facts indicate that Florida had and has growth potential. A state ports authority could actively compete with other states which are supporting their ports. There is no doubt in the writer's mind that, with a state ports authority,

TABLE II—TOTAL POPULATION AND PERCENT INCREASE FOR THE UNITED STATES AND FOR SIX SOUTHERN STATES: 1930, 1940, 1945, 1950, 1955
(*short tons millions*)

	1930	1940	1950	1955
United States				
Total Population	122,775,046	131,699,275	150,697,000	163,566,000
% Increase		7.24%	14.45%	8.53%
Florida				
Total Population	1,468,211	1,897,414	2,771,000	3,650,000
% Increase	51.6%	29.2%	46.1%	31.7%
Alabama				
Total Population	2,646,248	2,832,961	3,061,000	3,033,000
% Increase	12.7%	7.1%	8.1%	−0.9%
Louisiana				
Total Population	2,101,593	2,363,880	2,684,000	2,927,000
% Increase	16.9%	12.5%	13.5%	9.1%
South Carolina				
Total Population	1,738,765	1,899,804	2,117,000	2,283,000
% Increase	3.3%	9.3%	11.4%	7.8%
Georgia				
Total Population	2,908,506	3,123,723	3,445,000	3,621,000
% Increase	.4%	7.4%	9.1%	5.1%
North Carolina				
Total Population	3,170,276	3,571,623	4,062,000	4,285,000
% Increase	23.9%	12.9%	13.4%	5.5%

Sources: U. S. Department of Commerce, Bureau of Census.

Florida ports would have increased their percentage of United States total waterborne commerce to a greater degree since these increases are justified by the population and retail sales volume figures presented.

Conclusions

Due to the encouragement of the federal government, local and state administration over port matters is quite common today. There are arguments favorable to a local administration over port matters and, likewise, there are arguments favoring state administration. Whatever the level of public control the necessity is recognized for some degree of public authority in providing leadership and effective coordination in port development.

During the last decade the number of state port authorities in the seacoast states competitive with Florida has increased from two to five. Each state authority has developed modern facilities and has improved trans-shipment facilities in the seaports of the respective states. The completeness of these terminals varies, depending upon the length of time the body has been in existence and depending upon the amount and type of cargoes anticipated.

The success or failure of the state ports authorities in increasing the amount of cargo for their facilities cannot be cate-

TABLE III—RETAIL SALES VOLUMES IN THE UNITED STATES AND IN SIX SOUTHERN STATES: 1929, 1939, 1950, 1955
(*in thousands*)

	1929	1939	1950	1955
Total United States	$48,329,653	$42,041,790	$140,317,250	$185,543,993
Percentages of Sales Contributed by Florida	1.04%	1.46%	2%	2.33%
Florida	493,886	614,464	2,810,451	4,577,023
% Increase		24%	357%	63%
Alabama	518,972	435,973	1,743,086	2,351,870
% Increase		−16%	200%	35%
Louisiana	469,755	486,250	1,851,415	2,530,692
% Increase		4%	281%	36%
South Carolina	296,674	332,224	1,257,732	1,678,229
% Increase		12%	279%	33%
Georgia	627,171	624,765	2,310,587	3,305,686
% Increase		−1%	270%	43%
North Carolina	642,550	633,240	2,623,684	3,550,339
% Increase		−2%	314%	35%

Source: U. S. Statistical Abstract, 1955 for 1929 and 1939 figures: *Sales Management, Survey of Buying Power, Retail Sales, Yearly, Estimates for 1950 and 1955.*

gorically stated. There are many factors beyond the control of the authorities and the state which affect the amount of traffic moving by water. Federal policies, wars, crop failure or abundance, population shifts, and many other factors enter into the over-all picture of commodity movements.

The completeness of facilities at New Orleans and Mobile, created by the Board of Commissioners for the Port of New Orleans and the Alabama State Docks Board, does account in some measure for the increase in tonnage passing over the docks.

The ports in the states of Georgia, South Carolina, and North Carolina represent an attempt to attract general cargo by providing modern facilities. Private facilities, primarily built by the railroads, to handle local cargoes of timber, naval stores, and cotton were not maintained or improved when tonnages declined. Too limited a period of time has elapsed to evaluate the ability of the authorities in these three states to increase the cargo at their ports.

The legislative acts do not specifically require that the activities of port authorities are to be financially self-sufficient. However, with the possible exception of the state of Louisiana, the implication is clear that the revenues obtained from the operation of port authority's facilities are expected to pay operating and maintenance costs plus interest and retirement of principal on bonded indebtedness. A state-sponsored enterprise must receive the assurance of financial support of the state. That the

state may have to absorb deficits in one enterprise is no indication of an over-all loss to the state. The gains to the public and the state from modern efficient water terminals have not been measured by this paper. That such benefits exist there is no doubt.

A port authority for the state of Florida has been advocated in this study for the following reasons: other states competitive with Florida are supporting their ports with financial and promotional support; and the past and planned development of some Florida ports has been approved without economic justification. The first reason is related to the fact that Florida is surrounded by states with port authorities who have centralized their promotional policies thus putting the Florida ports at a distinct disadvantage. The second problem relates to the freight rate structure of the United States and the fact that there are 17 ports in the state of Florida with little hinterland. Ten of the Florida ports have local port authorities and the remaining are under the jurisdiction of their respective municipal government. All the ports would come under the control of the proposed Florida State Ports Authority.

The proposed Florida State Ports Authority could solve the following problems for the taxpayer of the state: prevent the over-expansion of port facilities in any one area; remedy the short-sightedness of a port; prevent harmful competition among Florida ports; and finally, present a sound promotion program for the state of Florida which would offset or match those of competing state ports authorities.

The Application of Benefit-Cost Analysis to Fish Preservation Expenditures: A Neglected Aspect of River Basin Investment Decisions†

By M. E. MARTS* *and* W. R. D. SEWELL**

THE CONFLICT of fish-versus-power constitutes one of the greatest obstacles to river basin development in the United States portion of the Pacific Northwest and threatens to become a problem of comparable dimensions in British Columbia. Traditionally fish protection at power dams has been viewed as a choice between two technologically differentiated alternatives: (1) if currently available fish passage technology gives reasonable assurance of preservation of the fish-runs past a proposed dam, no objections to the dam are interposed on behalf of the fish resource; (2) if fish passage technology does not promise success, fishery objections are interposed. Such objections may or may not be sustained by referee groups,[1] depending on the relative values involved and on the relative strength of the opposing interests.

The insignificance of the role played by economic analysis in this decision-making is remarkable.[2] There is some recourse to economic analysis in making the decision to sustain or overrule the objections of fishery interests. In general, however, it appears that installation of fish passage facilities is recommended solely on the basis of technical feasibility, without clear reference to costs involved and values of fish resources preserved. Multi-million dollar investments are made in fish passage facilities without being supported by any systematic economic analysis, whereas other investment aspects of the project under consideration will be buttressed with often elaborate economic studies.

The absence of economic analysis in fish passage investment decisions appears to stem from: (1) The difficulties inherent in evaluating fishery resources (i.e. the state of the arts in such analysis); (2) the finality of the consequences of interfering with a salmon run; (3) the importance attached to non-monetary values of fishery resources; and (4) the lack of announced objectives which might guide the selection of criteria for decision-making.

The reliance on technological criteria has obscured a serious problem of diminishing returns from investments in fish facilities in river basin programs and may lead to decisions which are unwise from the standpoint of economic efficiency. The authors do not argue that economic criteria should be the sole

† Editor's note. Just before this article went to press the senior author asked that an additional reference be cited. In discussing methods of estimating the value of the sport catch, he observes that similar problems are encountered in evaluating benefits of recreational areas. See discussion and proposal in, Albert M. Trice and Samuel E. Wood, "Measurement of Recreation Benefits," *Land Economics*, August 1958, pp. 195-207.

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[1] Referee groups include the Federal Power Commission, the Congress, and the state legislatures.

[2] The serious implications of the omission of economic analysis in project formulation have been stressed by a number of writers. Milliman, for example, writes: "The net result is that questions turning on legal issues of water rights and engineering questions of design, capacity, and location have been given extended discussion, while economic issues of primary importance have been almost totally neglected." Jerome W. Milliman, "Economic Aspects of Public Water Utility Construction," *Journal of American Water Works Association*, July 1958, p. 839. Sewell also has stressed the importance of economic analysis and consideration of alternatives in fishery preservation programs. W. R. D. Sewell, *The Conflict of Fish and Power: A Problem in the Water Resource Development of the Pacific Northwest* (unpublished master's thesis, Seattle: University of Washington, 1956).

basis for decisions that are basic to preservation of fish. The aim here is to point out the contribution which economic criteria can make to the decision-making process, the requisites for economic evaluation, and some of the implications of failure to consider economic criteria. The choice problem is viewed by the authors in the context of the contribution of fish and power to the total development of a given river basin rather than as a case of two mutually exclusive and discrete alternatives.

The attention here is to the economics of fish preservation rather than to measuring the importance of the fishing industry. The latter is taken for granted by the authors, and is adequately documented elsewhere.[3] Our concern, moreover, is not with biological, technical, or philosophical considerations. These matters also are adequately treated elsewhere.[4] We will assume that migratory fish preservation is the product of a part of the investment in a river basin program and consider the application of a benefit-cost form of economic analysis to this investment.

Role of Benefit-Cost Analysis

Benefit-cost analysis has come to be a conventional, generally accepted form of economic evaluation of water resource developments. Although benefit-cost analysis has been subjected to continuing criticism, such criticism has in the main been focussed on weaknesses in definitions and practices in carrying out the analyses rather than on the concept. Under the benefit-cost criteria used by the federal agencies a project or program is considered to be properly formulated and economically justified if: (a) the project benefits exceed the project costs; (b) each separable segment or purpose yields benefits at least equal to its costs; (c) the scale of developments is such as to yield the maximum net benefits; and (d) there is no more economical means of accomplishing the same purpose which would be precluded from development if the project were undertaken.[5]

The results of the evaluation of benefits and costs susceptible to quantification in monetary values are generally given summary expression as a "benefit-cost" ratio. This is expressed as a fraction or quotient obtained by dividing the costs into the benefits. If the benefits are estimated to be twice the costs, the project will have a benefit-cost ratio of 2 to 1. Any project having a ratio in excess of unity would be economically feasible.

As implied by the criteria set forth above, benefit-cost analysis when properly utilized is useful not only as a summary statement to guide decisions with respect to a total project but also as a tool in determining the economic limit of investment in—or size of—the individual segments of a multi-purpose project. It would be logical to apply benefit-cost analysis to the problem of determining the economic limit of investment in fish passage facilities as one of the segments of a multi-purpose development.

[3] See, for example, the Annual Reports of the Washington State Department of Fisheries (Seattle); Wesley C. Ballaine and Seymour Fiekowsky, *Economic Values of Salmon and Steelhead Trout in Oregon Rivers* (Eugene, Bureau of Business Research, University of Oregon, 1952); Robert F. Wallace, *An Evaluation of Wildlife Resources in the State of Washington* (Pullman, Washington: 1956); and James A. Crutchfield, "Economic Value of Washington Commercial Fisheries, 1955," *Pacific Northwest Business*, July 1957, pp. 5-15.

[4] See, for example, J. T. Barnaby, "Dams and the Columbia River Salmon," paper presented at the meeting of the American Society of Ichthyologists and Herpetologists, Western Division, San Diego, California, June 18, 1957; Milo C. Bell, "Salmon Fisheries versus Power Development," *World Fishing*, November 1954, pp. 392-396., 421-422; J. H. Cellars, "Hydro Kills the Fishing Industry: Columbia River Salmon Fishery," *Public Utilities*, March 1948, pp. 417-425; W. M. Chapman, "Fish Problems Connected with Grand Coulee Dam," *Stanford Ichthyological Bulletin*, Vol. 1, 1940; Edwin J. Cohn, *Industry in the Pacific Northwest and Location Theory* (New York: King's Crown Press, 1954); and Paul R. Needham, "Survival of Trout in Streams," *Transactions of the American Fish Society*, Vol. 77, 1949, pp. 26-31.

[5] Federal Inter-Agency River Basin Committee, Subcommittee on Benefits and Costs, *Proposed Practices for Economic Analysis of River Basin Projects* (Washington: 1950) p. 37.

For such application of this type of evaluation, however, there are certain requisites involving program objectives and design. These requisites involve complexities stemming from the interrelationships of fish biology, fish passage technology, and multi-purpose, multi-project river basin development.

Requisites for Evaluation

In river basin development, as illustrated for example by the Columbia River Basin developments, the range of possible objectives, of individual projects, and of segments of projects is very broad. To plan an integrated basin program efficiently, there must be agreement as to (1) the social and economic criteria for determining feasibility, (2) the objectives of the program, and (3) at least the basic elements—the major units, that is—of the total planned system.

A prime requisite is agreement as to the socio-economic policies governing decision-making. The program objectives can be defined and facilities designed only after the much broader social objectives have been agreed upon. These social objectives embrace such questions as defining in general terms the appropriate level of induced regional development, of exploitation of latent resources, and of preservation of natural environment. Given answers to such questions, it is then possible to decide whether a basin program is to produce maximum total benefits or maximum net gain from each of the several purposes served, or maximum benefit from a single main function with other benefits and losses accepted as incidental. These questions increase in complexity with increases in the scope of the program and in the variety of institutional participation.

After agreement is reached concerning social criteria and policies, a statement of objectives should make explicit whether the program is to produce joint products, or a main product (e.g., hydropower) with by-products. A program aimed at maximizing prime hydropower, for example, would normally comprise fewer and higher dams than a program in which secondary power is to be maximized, perhaps as a by-product of navigation improvement.

Finally—and this is of great importance to the economic evaluation of fish passage facilities, as will be shown later—comprehensive basin planning requires that there be reasonably firm plans as to the number, size, and function of the individual projects which together make up the total river development system. Each segment of each project can then be designed, constructed, and operated in the context of the total integrated system. There is general agreement that the capability of a power plant must be planned with reference to other plants on the same stream, and particularly with reference to up-stream storage. Similarly, though not generally understood, a fish passage facility (e.g., a fish ladder) at one of a series of dams is not an isolated facility. It is one link of a total preservation system to permit migration of fish between sea and spawning grounds. The capacity required for each link will depend on the efficiency of the total system as well as on the stream habitat (as it affects propagation and as it may be affected by the river development and other factors) and on the fishing pressure (that is, rate of escapement).

With knowledge regarding social policy, program objectives, and the planned system, it is possible to proceed efficiently with the analysis of individual projects and segments of projects including fish passage facilities.

Discussion of Costs and Benefits of Fish Facilities

A model benefit-cost analysis of fihs passage facilities, to be consistent with

benefit-cost evaluations made of other aspects of water resource developments, would compare the net annual costs of the facilities with the net value ("the benefit") of the fish resources which the facilities preserve. Both direct and indirect costs and direct and indirect benefits may be involved.[6] The indirect costs and indirect benefits may be of crucial importance in making decisions but the problems of measurement are exceptionally severe and require much further study than they have received to date. With present knowledge, however, it is possible to eliminate much of the uncertainty with which the direct costs and direct benefits have been treated.

Direct Costs. The direct costs of fish passage facilities are those involved in the construction and operation of the fish passage facilities at the planned level. If hatcheries or other facilities are required in addition to fishways to maintain the resource at the planned level, their costs should also be treated as direct costs. Some joint costs, such as a share of the cost of a dam and of the cost of land at the damsite, damages, and access roads, might also be included. Because of the difficulty of establishing a proper allocation of joint costs to the various functions served by a project, however, and because the fish program is a damage-mitigating rather than a product-producing function, a decision may be made to charge all joint costs to the other functions of the project. A special type of direct operating cost is the alternative value of the water required to operate the fish ladders. In the case of the Columbia River, for example, it has been estimated that the water used for the fish ladders could generate 45,000 kilowatts of additional power in the total system.[7]

Just as in the case of joint costs, a decision as to the appropriateness of a charge against fish facilities for the alternative value of the water is needed. In federal river project evaluations, it has not been customary to make a charge against each separate function for the value of the water required by that function. On the other hand, a charge for a share of the joint project costs is customary. One or the other charge might well be appropriate in the case of fish preservation, but probably not both charges.

The direct costs, in summary, include the construction cost with interest thereon and the operation and maintenance costs of the fish passage and related facilities and perhaps a share of joint costs or a charge for water required. These costs would be compared with direct benefits in order to calculate a benefit-cost ratio.

Direct Benefits. If the calculation of fishery values is to be consistent with that of other project values (such as those stemming from irrigation, power, or navigation development), the direct benefits of fish preservation should be defined as the net value of the fish preserved by the fish passage system. It has been frequent practice to use gross values in measuring the fish resources involved.[8] This may be perfectly defensible as a measure of the value of the fishing industry in a state or region but it does not permit proper comparison with analyses of other functions which are evaluated in net terms.

The calculation of the net value of a commercial fishery would presumably be made by subtracting the cost of fishing (including capital and overhead costs) from the gross price received by fishermen. Estimates of fishing costs are available or may be developed from industry data. The Federal Power Commission

[6] *Ibid.*, pp. 8-9 and elsewhere.

[7] E. S. Pretious, L. R. Kersey, and G. P. Contractor, *Fish Protection and Power Development on the Fraser River* (Vancouver, B. C.: University of British Columbia, 1957), p. 11.

[8] For example, see news releases and annual reports of the Washington State Fish and Game Department. This agency generally refers to either the processed value or the marketed value of the fish.

staff, discussing fishery values relative to the proposed Nez Perce dam on the Snake River, assumed that costs would amount to 80 percent of the marketed value of the catch.[9] This factor allows for marketing as well as harvesting. A crude factor applicable to harvesting costs only of 62 percent has been developed by the authors from data reported from British Columbia.[10]

A method of estimating net contribution to state income has been developed by Crutchfield which adjusts wholesale value of seafood products to a net basis.[11] His method, or something comparable, might prove satisfactory for making estimates of direct benefits of fishery facilities. It should be noted, however, that Crutchfield refers to one of the major problems in estimating future fishery values but does not feel this problem is susceptible to satisfactory solution. This is the problem of predicting fluctuations in the future abundance of fishery stocks. Ideally, an estimate of the annual net value of the fishery would be based on the average yearly volume over the amortization period of fish preserved by the passage facilities for subsequent harvest. In other words, the values estimated should be representative of average conditions during the period for which the estimate is made. If future harvest cannot be predicted, the capacity of the fish facilities presumably must be designed on the basis of past conditions, perhaps modified by judgment factors.

In addition to the estimation of future abundance, there are other awkward estimation problems involved. One of these is the "catch mix," that is, the proportions of fish caught by commercial and sport fishermen. This might prove to be an exceptionally difficult estimation to make but it has great significance because of the much greater value attributed to the sports catch than to the commercial catch in most estimates of fishery values.[12] Tendencies toward increased sports fishing and toward restrictions on commercial fishing, as are noted in certain areas, are pertinent to this estimation. So long as there are two or more types of fishing and a significant differental value assigned to the product of each this catch-mix estimate is essential.

The methods for estimating the value of the sport catch are inadequate. The money spent on sport fishing has been frequently used as a measure of the desire for this kind of recreation and thus as a basis for evaluating sport fisheries. This method has been criticized both for its grossness and logic[13] but no acceptable alternative method has been proposed. The problem is nothing less than quantifying satisfactions in dollar terms for which accepted methods have not been worked out.

In summary, any estimate of values preserved—benefits—by the passage facilities involves estimation of future catch by the various types of fishing carried on, and evaluation of the catch. These values must be expressed in net rather than gross terms in order to be comparable to other benefit-cost analyses and to avoid exaggeration. Once these estimates are available they may be compared with cost.

[9] U. S. Federal Power Commission, *In the Matter of the Northwest Power Company, Project No. 2173, Commission Staff Brief* (Washington: March 15, 1957), p. 9.

[10] Department of Fisheries, *Progress Report on the Economic Survey of Salmon Fishermen in British Columbia, 1953 and 1954* (Ottawa: 1955).

[11] Crutchfield, *op. cit.*

[12] For example, in the Corps of Engineers 308 Report on the Columbia River, salmon caught by sportsmen were valued at more than three times the value of salmon caught commercially. U. S. Army Corps of Engineers, *Review Report on Columbia River and Tributaries*, House Document No. 531, 81st Cong., 2nd Session (Washington: Government Printing Office, 1952), Vol. VII, Appendix P., pp. 2867-70.

[13] See, for example, Peter Larkin, "Use of the Sport Fishery Resource," *Transactions of the 10th B. C. Natural Resources Conference* (Victoria, 1957).

Benefit-Cost Comparison

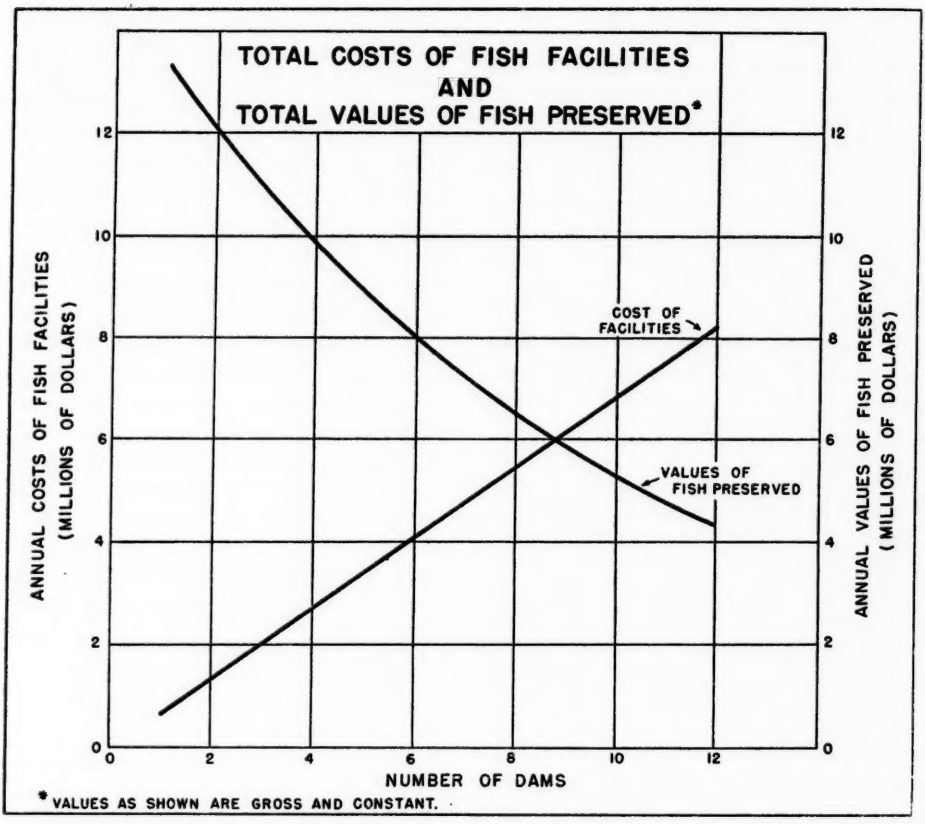
In comparing benefits and costs of fish preservation in a river basin program involving more than a single dam the analyst is immediately confronted by the problem of diminishing returns. The point of maximum benefit and minimum cost is the single dam (or literally probably no dam at all). Fishery biologists are reasonably sure that as fish are required to surmount fish ladders, or pass downstream, losses due to injury and delay occur. With the addition of each dam the physical volume of the resource preserved is diminished. With the addition of each dam and fish ladder to the system, however, the investment in fish passage facilities increases in large increments. The cost of preservation, thus, is an outstanding example of a case of diminishing returns: large incremental investments made to protect a decreasing number of fish unable to overcome the series of obstacles in their migration either as adults to the spawning grounds, or as young fish to the sea.

If the investment in fish passage facilities is to be made rationally there seems to be no alternative but to analyze the total system of facilities that may ultimately be constructed between the sea and the spawning grounds.[14] Inasmuch as the volume of fish preserved by each individual facility is dependent, in part, on the number of facilities the benefit estimate must be made for the system, not for each separate facility.

The graph (Figure 1) illustrates the problem. The value of the annual escapement decreases with each successive dam added to the system. As each dam is added, however, the cost of preservation increases (assuming each dam includes fish passage facilities). For example, under the hypothetical conditions assumed in the graph, a two-dam system allows an estimated escapement valued at slightly over $12,000,000, whereas a four-dam system, costing twice as much, preserves an annual estimated value of less than $10,000,000. The last economically justifiable increment of investment in fish preservation under the assumed conditions would be the eighth dam. Beyond such a limit the benefit-cost ratio is less than unity and a decision to construct further fish passage facilities must take into account the fact that the benefit-cost ratio is unfavorable. It should be stressed that the analysis suggested by the graph is of a total system of passage facilities. Although the graph is intended to be hypothetical its data represent a rough approximation of the Columbia River fish passage system. Total cost of fish facilities (right vertical axis) comprises the following: (a) annual amortization charges based on assumed $15,000,000 capital cost of fish facilities per dam, repaid over a 50-year amortization period, on a 3% sinking fund basis, (b) annual interest charges of 3%, and (c) annual operation and maintenance cost of $100,000 per dam. Total value of the fish preserved (left vertical axis) is determined by: (a) an assumed annual escapement of 500,000 fish with one dam, and a 10% cumulative loss as each successive dam is added; (b) spawning value of catch assumed as $27.00 per fish (15 pounds at $1.80 per pound).[15] The number of dams (horizontal axis) approximates the number planned for the

[14] This, it might be noted, is only one of many instances where comprehensive river basin planning allows efficiencies not otherwise available.

[15] The ratio of fish landed to spawners has been assumed at 3:1. The value of a fish landed averages about 60 cents per pound. In view of the uncertainties in the estimates and the hypothetical nature of the data, the authors have used constant "gross" values here.



Columbia River system which include fish ladders.[16]

The authors have no knowledge that an analysis of a total fish passage system was ever prepared in the planning stages of any or all of the Columbia River dams. Presumably, because of the long period over which the Columbia River basin development has evolved, such an analysis could only be prepared after the fact. The opportunity exists, however, on other streams where development programs have not yet been initiated, to approach the analysis of the fish preservation facilities in this or some comparably comprehensive manner. Notable among such opportunities would be the Fraser River of British Columbia on which no main stem structures have yet been built and where interest in hydropower development is frequently expressed.

Conclusions

The emphasis on technological criteria has obscured the problem of diminishing

[16] For data concerning the Columbia River fish preservation system, see United States Fish and Wildlife Service, *Statement by the Fish and Wildlife Service in Response to Request, Dated November 20, 1953, of Senator Styles Bridges for Information on the Distribution and Value of the Columbia River Fish Runs, the Effect of Dams on these Runs, and Certain Other Related Information* (Portland, Oregon, December 1953, mimeographed).

See also, Bob Woods, "Kilowatts and Salmon," reprinted from a series of articles appearing in *The Wenatchee Daily World*, Wenatchee, Washington (February 27 to March 10, 1958). A convenient review of information on Columbia River fish facilities and research programs is also contained in Pretious, Kersey, and Contractor, *op. cit.*

returns on investments in fish facilities. It has perhaps contributed to a single-project rather than to a river system approach to fish facilities and is related to the implicit assumption that fish passage facilities—chiefly ladders—or non-construction of dams are the only means of preserving anadromous fish resources. The result has been to divert attention away from consideration of alternative schemes, pointed out by Sewell,[17] of fish preservation such as relocation of fisheries, transport systems other than ladders, and fish preserves. In addition, no consideration has been given to alternative employment of the labor and resources now employed in the fishing industry. In a large program of river development, such as that on the Columbia, the technological approach is inadequate to avoid the risk of investing more money in fish preservation than the fish preserved are worth. That is, the technological approach fails to define a minimum efficiency limit other than perpetuation of the race which may be well below any conventional economic minimum.

Such economic evaluations of fish resources and facilities as have been made heretofore suffer from two fatal weaknesses: (1) they have not been made in a way which facilitates proper comparison with other, competing demands for water resources; and (2) they have not taken into account the fact that a fish passage facility is part of a total system. Most economic evaluations have been primarily estimates of the value of the fishing industry to a local or regional economy and, with rare exceptions, have been expressed in gross rather than net values. Such evaluations are of little aid and may even be misleading as guides to optimum resource development decisions when they are compared with evaluations of competing resources expressed in net terms. Failure to recognize the system nature of the river development and the fish passage facilities can lead to gross error in estimates and comparisons of economic efficiency.

Benefit-cost analysis provides an objective method of determining the limit of economic investment in fish preservation—and hence, depending on relative values and public policy, possibly of the economic limit of development of a given river. This type of analysis, properly applied, reveals clearly the system nature of preservation facilities and the problem of diminishing returns as further dams are added. The approach conforms to the postulates of comprehensive planning because it requires that the entire river system be viewed as a unit for purposes of analysis. Benefit-cost analysis is applied to other functions of river development projects. To avoid such analysis in the case of fish preservation may be reasonable in the early stages of regional and river basin development when alternative dam sites are available. In an expanding economy, however, where the pressure on local natural resources and the complexity of resource programs are increasing rapidly, the need to channel investment in resource development into its most economic paths becomes progressively more imperative.

The authors argue that economic criteria would strengthen the decision-making process by the application of all reasonable approaches and criteria. Benefit-cost analysis can be a useful tool in determining the limit of economic investment in fish preservation. Once that limit is reached, justification of additional investment will properly rest not on technical or economic criteria but on social and philosphical consideration.

[17] Sewell, *op. cit.*, p. 60ff.

New Hope in Italy: Land of the Noonday Sun†

By JIM E. DAVIS*

STRONG feelings of sectionalism exist between North and South Italy, and the Italian people have begun only recently to realize that the prosperity and progress of one region is limited by the degree of prosperity and progress in the other. Central to the problem of aiding the depressed agrarian South is the question of land reform, which the Italian government has moved energetically to meet. A new series of laws and policies have evolved since World War II, in an attempt to narrow the economic and social schism between the regions. The departure from a prewar emphasis on local initiative and expenditure, the work of the land reform authorities, the accelerated provision of agricultural credit, and especially, the comprehensive nature and long-term tenure of these programs signifies a "maximum effort" by the Italian government.[1]

The Italian peninsula had no unity nor real independence from the time of the fall of Rome to the unification under Cavour in 1861. During this turbulent period there were many different masters —Goths, Franks, Lombards, Saxons, Normans, Saracens, Spanish, French, and Austrians held various parts of the country. Feudalism, fostered by the Normans and Bourbons in the South, held on for several centuries there, even after it had all but vanished from the Germanic dominions in the North, with important consequences for the social structure and land tenure system in the *Mezzogiorno*.

The superior political strength of the North at the time of unification is reflected in the subsequent history of Italian legislation. From 1861 to 1915 almost 330,000 hectares (1 hectare is equal to 2.47 acres) of land in the North were reclaimed with public funds, while only 2,000 hectares were restored to cultivation in the South.[2] Tariff and taxation policies, such as the wheat subsidies begun in 1926, worked to the advantage of the North. Although the South is primarily an agricultural area the density of population per hectare of good land is such that wheat must be imported to supplement production in the *Mezzogiorno* itself. Wheat is the principal element in the Southern diet, consumed as bread and in the myriad forms of *pasta*—spaghetti, vermicelli, macaroni, etc. The wheat subsidy program raised the cost of living in the South, and in addition adversely influenced agricultural employment by encouraging a shift in land utilization from olives and grapes (more labor-intensive) to wheat (less labor-intensive).[3]

In the North as late as 1909, 1,650,000 of the 3,900,000 adult males could vote, while only 850,000 of the 3,500,000 adult males in the *Mezzogiorno* were enfranchised. By 1919 the laws had been changed, but the entry of fascism and the accompanying suspension of the democratic process meant that the political imbalance continued until the adoption of the new constitution after World War II.[4]

Up to the period shortly before the second World War, land reclamation

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† The Italian mainland south of Rome, plus the islands of Sicily and Sardinia, is called the *Mezzogiorno*, or "noonday" because of its long summer days when the sun seems always to be at the zenith.

[1] The International Bank for Reconstruction and Development has made assistance loans to the Cassa per il Mezzogiorno, which is the financial authority for the overall development program in the South.

[2] United Nations, Department of Economic Affairs, *Economic Survey of Europe in 1953* (Geneva, Switzerland: United Nations, 1954), p. 133.

[3] *Ibid.*, p. 135.

[4] Ruggero Grieco, *Introduzione Alla Riforma Agraria*, (Turin, Italy: Giulio Einaudi, Editore, 1949), p. 46.

schemes were concerned mainly with the problem of drainage, while the pressing need in the South for terracing and irrigation was largely neglected. Some public works for southern agriculture were approved but the dilatory rate of execution actually brought little relief.[5]

As late as 1946 there remained significant differences in the standards of public policy as applied to the two sections of Italy. In that year a law was passed setting up funds to relieve agricultural unemployment by a program of public works. Through 1947, the state had expended 2.60 billion lire in North and Central Italy, and only 1.15 billion lire in the South and the Islands. During that period agricultural unemployment in the northern provinces of Venetia, Tuscany, Piemonte, and Liguria was 9%, 4%, 2%, and 1% respectively; while in the southern provinces of Puglia, Lucania, Calabria, and Sardinia, the percentages of unemployed agricultural workers were 50%, 37%, 33% and 42%, respectively. Clearly the expenditures were not in proportion to the magnitude of the need but in proportion, if not in response, to political power. Agricultural credit extended by the state for the same year totalled 1.5 billion lire in the North and Central regions; .3 billion lire in the South and the Islands.[6]

World War II put the crowning touch to the history of misfortune in the *Mezzogiorno*, for it was at Anzio, Salerno, Cassino, and Naples that the most destructive fighting of the Italian campaign took place. The war in Italy destroyed crops on 771,000 hectares of cultivated lands, 600,000 head of cattle, 400,000 pigs, 142,000 horses, and 1,000,000 sheep and goats, as well as 45,000,000 cubic meters of rural housing and farm buildings. A disproportionate share of all of these was in the South.[7] Twenty-eight percent of industry in the South was destroyed by World War II as compared to eighteen percent in the North.[8]

The chief problem of agriculture in the *Mezzogiorno* has always been the unfortunate pattern of rainfall. The total precipitation for the year is similar to that in the North, but the southern rains occur mainly in the winter, at just the wrong time to be of use in the growing cycle. The long Mediterranean summer, with its magnificent sunshine, is without significant rainfall. The heavy rains of the winter, falling on the overgrazed, long-since-deforested hills of the south, have created a serious problem in land reclamation. Not even goats can graze on much of the land. Population pressures are so great that cultivation has been extended up the hillsides and into mountain areas which should have remained in forest and grasses in order to prevent erosion and floods.

About 27% of the Italian national income in 1955 was derived from agriculture and forestry. As about half the nation's employed are in agriculture, the per capita income from agriculture can be only about one-third that from other pursuits. Partly because the southern region is more agricultural and partly because of its higher percentage of handicraft and service occupations, per capita income in the *Mezzogiorno* in 1955 was only about 54% of the $332 national average.[9]

The gulf which exists between the two regions has other dimensions than income: such as employment, education, birth rate, and age composition of the

[5] United Nations, Department of Economic Affairs, *op. cit.*, p. 133.

[6] Gaetano Savemini, *Scritti Sulla Questione Meridionale 1896-1955*, (Turin, Italy: Giulio Enaudi, Editore, 1955), p. 618.

[7] Presidency of the Council of Ministers, *Ten Years of Italian Democracy: 1946-1956* (Rome, Italy: Documentation Centre, 1956), p. 191.

[8] United Nations, Department of Economic Affairs, *op. cit.*, p. 135.

[9] Presidency of The Council of Ministers, *op. cit.*, p. 216.

population. Per capita consumption of electric energy in 1950 was 138 kwh in the South, as against 603 kwh in the North. In 1948 illiteracy increased southward, with 2% in Lombardy, 7% in Tuscany, 20% in Campania, 32% in Calabria, and 26% in Sicily.[10] The index of "literacy" does not tell the whole story; the attrition rate after the fourth grade of elementary school is quite high in the South. Compulsory attendance laws have not been well enforced and even in large cities the number of children under 14 who are full-time employees is quite high. Naples, the largest industrial center in the South, has about 8% of its workforce in industry, while Milano, the "Pittsburgh" of the North, has about 29%. Furthermore, much of the "industry" of the South means small shops devoted to handicrafts —like smithing, tailoring, shoemaking, milling.

Density of population per square mile is 396 persons for Italy as a whole as against about 55 for the United States. While the *Mezzogiorno* has only 40% of the total population, the density of agricultural population exceeds 500 persons per square mile in some parts of the South. The respective rates of natural increase in the North and South indicate that relative population pressures will get worse before they get better. The natural increase per thousand population in North Italy in the period 1936-40 was 6.9, and this figure *decreased* to 5.3 by 1950, while in the South it *increased* from 13.8 to 16.1.[11] In part a reflection of this, the *Mezzogiorno* has a surplus of children and a marked deficiency in the age group 20-65.

[10] Associazione Per Lo Sviluppo Dell' Industria Nel Mezzogiorno, *Statistiche Sul Mezzogiorno D'Italia, 1861-1953*, (Rome, Italy: 1954), p. 769.

[11] Bernardo Colombo, "Preliminary Analysis of Recent Demographic Trends in Italy," *Population Index*, October 1952, p. 277.

Land Ownership in the South

Economic development of the *Mezzogiorno* necessarily means changes in Southern agriculture. First, the long history of feudalism in the area has resulted in considerable concentration of ownership in large holdings, which are often, but not always, carried on by extensive agriculture, with a small return per acre. Second, there are also large numbers of fragmented peasant holdings, many at completely uneconomic distances from the dwelling places of the tillers.[12] Third, there is a system of tenancy which offers varying degrees of security and permanence to the tenant, depending upon the type of contract he holds. The existence of a large percentage of landless laborers, who lead a precarious existence, is another complicating factor. Besides these, of course, there is need to revise techniques and tools, adopt new crops, terrace and reforest, and build irrigation facilities.

Historically, few Italian lands were open for sale. Royal, feudal, and ecclesiastical lands were extensive, and entail procedures kept many private holdings off the market. The existence of a free market in land really began with the secularization of much of the Church's holdings in the 14th and 15th centuries. There were various attempts in Italian history to redistribute lands with varying degrees of success; but the most common result in the South was that the new peasant owners had not sufficient funds to maintain their lands, and latifundia reappeared. The passing of lands into peasant control, even temporarily, often had another undesired effect—denuding of the forested slopes and extension of the plow into uncultivable areas.

[12] It is not uncommon for Calabrian peasants to spend 5 hours per day hiking to and from their scattered fields.

Of the 28 million hectares of "productive land" in Italy about 24 million hectares are private property. Most of the 4 million hectares owned by the state or village communes is forest and pasture land.[13] Only 15% of the geographical area of the South is plains, with 54% in hills and 31% mountainous. Thus the average figure of 2.5 hectares per person actively engaged in agriculture in the South is further worsened by the character of the land.

It is difficult to categorize Italian landholders in terms not ambiguous to students of American agriculture. For example, Rossi-Doria says that "owner-cultivators" are found on 37.5% of the total farm area in Italy.[14] Medici writes: "The 'peasant owner-operator holding' . . . is found on 31% *of the area occupied by small private property.*[15] (Emphasis added.) Vanzetti asserts that "owner operators" hold 73.7% of the total cultivated land.[16] Comparison of these figures indicates that these authors are not talking about the same group of farmers, however similar the terms used may appear. The difficulty lies, I believe, in drawing the line between farmers who variously own their land, rent some of their land, do their own work, use hired farm labor for the bulk of the work, or combine these elements in varying proportions. Until more precise agreement can be formulated as to definitions, descriptive statistics can not be as meaningful as they might otherwise be. Many Italian landowners bear little resemblance to the American "owner-operator." They are not absentee owners because they live on the land; and they are "operators" only in the sense that they supervise the work done by tenants or hired laborers.

The larger owners of land in Italy have variously: (1) invested large sums and increased production, (2) rented to "large" tenants who used progessive legal and mechanical techniques, (3) let "*mezzadria*" contracts (described below) with varying results, or (4) passively held the land, renting it in small parcels to backward peasants without investment by either party. Interspersed within this structure are the various types of tenants, and the landless laborers.

Tenancy in the South

The most stable type of smallholding tenant is the "*mezzadro*" who commonly supplies half the operating capital and all the labor, and receives half the fruits of his labor. The fifty-fifty division of the produce may undergo revision according to the degree of labor-intensity, the value of the crop, or simply the competition of tenants for possession of the land. Further variations may include a cash-rent arrangement for pastures, with the tenant assuming the risk of raising cattle and retaining title to the stock. Medici asserts that there are whole regions in the South where the fertility of the soil is such that half the return would not feed the man who did the work, so that the share arrangement is modified in favor of the tenant.[17]

The Southern tenant typically has a plot too small or a crop too limited to absorb all of his family's labor, but the general labor surplus is so great in the area that no market for their services exists. Part-time jobs in the town are always in demand whenever available. The typical *mezzadro* tenant has come to assume more and more of the risks of production, and to share more and more

[13] Manlio Rossi-Doria, "The Italian Agrarian Reform," *Land Tenure*, ed. Parsons, Penn, and Raup (Madison: University of Wisconsin Press, 1956), p. 391.

[14] *Ibid.*

[15] Giuseppe Medici, *Land Property and Land Tenure in Italy* (Bologna, Italy: Edizioni Agricole, 1952), p. 193.

[16] C. Vanzetti and F. Meissner, "The Agrarian Reform in Italy," *Land Economics*, May 1953, p. 145.

[17] Giuseppe Medici, *op. cit.*, p. 130.

in the returns, meaning that the *mezzadria* contract may offer the possibility of attaining independent ownership. Such is not the case, however, with all tenancy contracts, nor with the day-to-day tenure of the "*giornale*," or day laborer.

Another form of tenancy less common —and less desirable from the tenant's point of view—is the "*compartecipazione*," or sharecropping arrangement. In Italy, as in the United States, the chief difference between a tenant and a sharecropper is the control which the tenant has over his work but which the sharecropper does not have. "The *compartecipazione*," says Medici, "never acts as a ladder up; it is merely a form of labor contract."[18] Sharecropping is found mainly in the latifundia of Calabria, Latium, Sicily, and Sardinia. The landlord's share often amounts to two-thirds of the crop. The use of hired labor on Italian farms is much greater than in the United States. Some of the terms used for employees of a dairy farm are illustrative: *fattore*—"boss," an agent of the owner, paid with a percentage of the profits of the enterprise, *capo cavallante*—in charge of the horses, *capo bifalco*—in charge of the cattle, *mungitore* —milker, *mandriane*—herdsman, *campagnone*—watchman (one for day; one for night), *direttore*—(tractor) driver, *camparo*—gateman for irrigation system.[19]

The statistics on land ownership in Italy previous to the changes being made by current programs show that 54% of the number of holdings were less than one-half hectare in size, and the total of the land area in this class was only 4% of the land owned by private individuals. Another 29% of the holdings were between ½ and 2 hectares, amounting to 13% of all the land in private hands.[20] In 1946, 93% of all holdings were under 5 hectares each, and occupied only 31% of the farm area. Holdings of 100 hectares and over, totalling 26% of all farm area, were owned by .3% of the number of farmers.[21] Latifundia are found mainly in the central and southern parts of Italy, accounting for about 2 million hectares in area. In the Sila Plateau, a region in which latifundia abound, 137 individuals until recently owned more than 400,000 hectares, or 30% of all the agricultural land in the region.[22] In Calabria, properties over 300 hectares totalled 100,000 hectares, of which 3 owners held 33%.[23]

In other words, there has been a great mass of small holders and tenants on pieces of land of inadequate size, and a few owners holding title to extensive lands. Considerable impetus to a land reform program was given by the "spontaneous redistribution" of lands that occurred as an aftermath of the participation of armed peasant irregulars in World War II. The peasants simply used their arms to acquire lands. Most of these seized lands were reclaimed but the pressure for land reform brought forth a new series of laws designed to give some redress from the maldistribution of land ownership, especially in the latifundia districts of the South. From this matrix has come a series of laws designed to increase agricultural production, create employment for the jobless, set up new and independent farmers in large numbers on expropriated and reclaimed lands; and to build roads, housing, electric power plants, aqueducts, and even whole villages that are required to make the reforms effective.

[18] *Ibid.*, p. 146.
[19] *Ibid.*, pp. 147-48.
[20] *Ibid.*, p. 27.
[21] United Nations, Department of Economic Affairs, *Progress in Land Reform* (New York: United Nations, 1954), p. 13.
[22] Vanzetti, *loc. cit.*, p. 153.
[23] Manlio Rossi-Doria, *loc. cit.*, p. 398.

Land Reform Legislation

A series of laws began with the reclamation law of 1933 which became a model for other countries in the matter of establishing criteria for granting government assistance to reclamation projects. Under this law, loans up to 38% of the cost of land improvements could be granted in the *Mezzogiorno*, 75% of the cost of aqueducts and 45% of the cost of electrification.[24] One of Mussolini's major accomplishments was the drainage of the Pontine Marshes, in the coastal plain just south of Rome. Extensive plans for land settlement and reclamation in Puglia and in Sicilia were interrupted by World War II. Beginning in 1947, with the creation of the *Istituto Nazionale Di Economia Agraria*, established for the purpose of research on the problems of agriculture, the future of the agricultural South began to look brighter.

First of these land reform laws was the Legge Sila, Act N. 230, of May 15, 1950. Legge Sila affects a total area of 532,000 hectares, (from which only 73,274 hectares had been expropriated by December 1956).[25] The area involved is fairly homogeneous in type of agriculture and concentration of ownership, though it does not correspond exactly to any political nor geographic boundary. The program calls for considerable expenditures for reclamation in addition to compensation payments. The Sila development authority estimates the reclamation expenditures to average 124,680 lire (about $200) per acre and indemnity payments to run about 26,600 lire (about $42) per acre.[26] The new owners are selected according to a rather complicated system which gives precedence to landless workers resident in the area.[27] The new farmers are to repay the compensation expended by the state for land acquisition plus 2/3 of the expenditure on improvements, within a period of 30 years during which they pay interest at 3.5%. The first two years of occupation are exempt from payment on the principal, although interest charges must be maintained.

The first lands assigned under Sila were in holdings of slightly more than 10 acres each, but the individual plots were scattered to achieve crop diversification and equity in the distribution of certain kinds of soil. It is not clear that the size of new holdings was selected on the basis of economic efficiency. Political pressures to satisfy the maximum number of land-hungry peasants are difficult for a democratic government to deny. The Sila development authority, in addition to reclaiming, terracing, irrigating the land itself, is empowered to build rural roads, lay piping for drinking water and electricity, dig sewers, build oil presses and flour mills; in effect, it erects whole villages for the assistance not only of the new settlers but of the other residents in the reform area. These expenses are not part of the reclamation expenditures as such, and are not repaid by the new owners of the reclaimed lands.

Under the Sila act, lands over 300 hectares in possession of a single owner are to be expropriated, the owners being compensated by the issuance of 5% interest-bearing bonds, with a maturity of 25 years, in an amount proportional to the earnings of the land as declared in the cadastral survey of 2 years previous to the date of expropriation.[28] The bonds will be accepted by the government in payment of taxes on remaining lands and may thus be redeemed a little in advance of the 25-year maturity date. Owners

[24] Presidency of The Council of Ministers, *op. cit.*, p. 204.
[25] Presidency of the Council of Ministers, *op. cit.*, p. 199.
[26] Vanzetti, *loc. cit.*, p. 153.
[27] Stralcio Reform Authority, *The Agrarian Reform in Puglia, Lucania and Molise* (Bari, Italy: Arte Grafiche Laterza, 1957), p. 25.
[28] Manlio Rossi-Doria, *loc. cit.*, p. 394.

subject to expropriation may petition to reclaim at their own expense 1/3 of the expropriated area, up to 300 hectares. One-half of the area so improved must go to the state at the end of 2 years but there remains in the Sila area an effective ceiling on holdings of 450 rather than 300 hectares.[29] As the cadastral register has been kept in "prewar" lire a form of poetic justice has been active. The 1958 lira, at 625 to the U. S. dollar, is worth considerably less than the 1939 value of about 10 to the dollar, meaning that landowners have been very pleased to pay taxes in 1939 lire, but very unhappy indeed to be compensated for their property on that basis. Honesty in the declaration of land values has been rewarded here, for the higher the declared earnings of the land, the higher the compensation.

The second major law dealing with agricultural reform was the Legge Stralcio of October 21, 1950, which incorporated some of the provisions of Legge Sila, but made certain important changes. As neither the type of cultivation nor system of ownership showed any uniformity in the area in question, the rules governing expropriation are quite different from those of Sila. Again recourse is had to the cadastral register. Percentage portions of the land held are expropriated according to the total amount of assessed value reported. Within the "steps" of assessed value, discounts are given for efficiency; *i.e.*, a landowner with a property whose total taxable worth was 50,000 lire would expect to have a lower percentage of his land taken than a man with a property worth 100,000 lire. Of two owners each having a property worth 100,000 lire on the tax rolls, the man who had reported a higher income per hectare would have a lesser percentage of his land expropriated so that the efficient big farmer might keep more of his land than the inefficient big farmer. This device not only rewards efficiency and intensive as against extensive cultivation, but also avoids taking the same percentage of good and poor lands.

Land Development Authorities

Growing out of the Sila and Stralcio laws are the reform (or development) authorities, autonomous regional boards set up to administer the provisions of the laws in particular areas. The principal development boards are: (1) Sila Development Authority, (2) Po Delta Development Authority, (3) Maremma-Tuscany-Latium Development Authority, (4) Tucino Development Authority, (5) Land Reform Section of the Veterans' Welfare Organization, (6) Sardinia Land Development Authority, and (7) the Sicilian Land Reform Authority. The powers of the development authorities are quite extensive, ranging from expropriation to the building of village recreation facilities.

The various reform authorities operating under Stralcio in seven regions of the mainland plus Sardinia, are, like the Sila development authority, obliged to turn over the land to the new settlers in viable plots; that is, the reform authorities must have made the necessary improvements, which includes everything from the actual rebuilding of the land itself to the founding of marketing cooperatives and machine stations, as well as schools and agricultural extension services. The settlers, for their part, are obliged to become members of the cooperatives. One astute writer notes on this question that the enormous sums expended by the government on reclamation and provision of the necessary services means that the government agencies must necessarily be reluctant to extend

[29] United Nations, *Progress in Land Reform*, p. 72.

complete self-direction to the newly-made owners because of the political consequences of mismanagement by the peasants as the failure of the scheme would reflect on the party in power. This could result in some form of state-administered collective farm, rather than truly independent units.[30] Much will depend, in this regard, on the availability of agricultural credit to the new owners and the efficacy of the training programs set up to convert landless workers into farm owner-managers. At least one protection for the new owners exists now with the *Stralcio* provision that expropriated owners must not enlarge their holdings for 6 years. It is interesting to note that the authorities' power of expropriation is expressly granted for the purpose of "land reform and division into small holdings." The second problem arising from the skewed distribution of land holdings in Italy, that of consolidating the minifundia, is specifically outside the province of the current land reform. Longstanding rights of use of land in village communes, as well as property rights of individual small-holders, must be respected and take precedence over the economics of agricultural development. The right wing had its day under Mussolini, and the weight of the small landholders is felt now. All political parties had land reform planks after the war but so far no serious effort has been made to bring together the small owners' scattered plots into an economic unit. Indeed, the problem is being perpetuated by the action of the reform authorities in issuing scattered plots to the new individual owner in the effort to preserve equality among the recipients. Any land reform program has inescapable social overtones, and here is apparently a real Gordian knot. It will take a political swordsman of sharp courage to find its solution.

As of December 1956, the total land which had been reassigned by the various authorities under both laws amounted to 578,649 hectares, divided among 104,417 new farmers, for an average size of new holdings of 5.5 hectares.[31] As most of the land expropriated was in areas with mountains, hills, eroded slopes, heavy soils, or soil too poor to support intensive cultivation without considerable investment, it remains to be seen whether the reform authorities, pressured as they are to effect the transfer of ownership as quickly as possible, have been able to do enough for this land to make possible permanent settlements of such small size.

The above figure for expropriated lands, 578,649 hectares, is not far short of the 700,000 hectares goal. The difference of about 122,000 hectares is doubtless explained by the "self-development" provision of the Stralcio law; exemptions for mining and forest land and industrial areas; and recognized sales of land "for the creation of small holdings." It is a very difficult matter to write a land reform law in such a way that the owners of latifundia cannot find ways to evade expropriation, but the Italian law is apparently a signal success in this regard to date. As mentioned above, the six-year prohibition against reacquisition by the landlords is a real advance, as is also a provision that the new owners must satisfactorily perform for two years before they acquire title to the land. As yet, however, the land expropriated is only about 2.5% of the total land in production, and the creation of 100,000 new farms is by no stretch of the imagination a full solution to the problem of agricultural unemployment in the *Mezzogiorno*.

[30] Doreen Warriner, *Land Reform and Economic Development* (Cairo, Egypt: National Bank of Egypt, 1955), p. 40.

[31] Presidency of The Council of Ministers, *op. cit.*, p. 199.

Two additional boosts have been given the Southern economy by the actions of the reform authorities, in addition to the establishment of new farms. The first is the provision of hundreds of thousands of jobs (largely pick-and-shovel jobs) on the reclamation works and building programs undertaken in the course of land reform. This may not seem the most efficient way to use a man's services, but in an area where the average year's employment for an able-bodied man may go as low as 150 days, any source of additional income is avidly sought. More than half of all development expenditures in Southern Italy have gone to wages and salaries.

Co-operatives: Farm Credit

The second impetus to the Southern economy is a more lasting one. It concerns the aid given to the whole reform region (not merely to the new settlers themselves) by the operation of schools, building of roads, formation of co-operatives, and loans to private enterprise for the provision of electric and other services for which the reform authorities are responsible. In regard to training the new farmers, an Institute for Agricultural Education has been set up, eventually to operate 25 schools for the assignees and others. In co-operation with the Ministers of Education, the reform authorities have set up 340 new elementary schools and 35 nurseries.[32] They have founded cooperative societies for both marketing and purchasing (the latter extended by some groups to include such consumption items as television sets) and, for the time being, provide the initial operating capital for the co-operatives, to be reimbursed by the members at a later date. As of December 31, 1955, 530 service cooperatives with 33,042 members, 27 processing co-operatives with 1,322 members, and 90 credit (for stock purchase) cooperatives with 5,200 members had been formed.[33]

The reform authorities have supplied on a loan basis most of the machinery involved in the work of reclamation, but credit has been extended to co-operatives and to individuals for machinery purchase. The number of tractors in Italy has increased from 30,000 in 1939 to 70,000 in 1952, 168,000 in 1956, about half of which are of Italian manufacture.[34] A shortage of skilled tractor and machinery repairmen is apparent in some regions but this is believed to be a temporary phenomenon. The transition from overhauling the ubiquitous Italian motorscooters to repairing tractor engines is not insurmountable, and scooter repairmen abound.

Foremost among the various sources of agricultural credit is the law of July 25, 1952, known as "The Twelve Year Plan For The Development of Italian Agriculture," which is intended to supplement the operations of the agricultural credit banks. Central feature of this program is a rotating fund of 125 billion lire to be invested by the Italian treasury over a five-year period. This money will not be repaid to the treasury until 1964 and, in the meantime, the principal and interest payments will be re-loaned as often as possible. Interest charges are 3 percent per year and the loans may amount to as much as 75 percent of the total expenditure for purchase of (Italian-made) machinery for irrigation or farm buildings. By mid-1955, loans under this program totalled 100 billion lire for the purchase of 8000 pieces of agricultural machinery, 4000 irrigation installations, and 70,000 farm buildings. The law is,

[32] Presidency of The Council of Ministers, *op. cit.*, p. 199.

[33] Stralcio Reform Authority, *op. cit.*, p. 83.

[34] Istituto Centrale Di Statistica, *Annuario Statistico Italiano*, 1956, p. 175.

of course, not restricted to the new farmers set up by the reform authorities, and is in addition to the agricultural credit banks, which are empowered by various laws to make loans at low interest rates for reclamation, for the establishment of small holdings, war-damage reconstruction, flood relief, and mechanization.[35]

[35] Anonymous, *Cassa Per Il Mezzogiorno* (Rome, Italy: Arte Della Stampa, n.d.) pp. 3, 4.

In summary, the approach to the problem of land reform in the South has changed radically in the postwar period. Sectionalism has been overcome, and a new, unified public policy is being developed in the interest of mutual aid between the two regions. The land reform laws and policies described here are comprehensive. Their ultimate success cannot yet be assessed for some time to come, but indications are that all of Italy will benefit.

Reports and Comments

On Returns to Scale in Crowded Peasant Economies

IN discussing land transfer programs in peasant economies where there is a high population density, the argument is sometimes advanced that breaking up large holdings, even when farmed by tenant farmers, puts a serious obstacle in the way of eventually achieving greater technical efficiency in the economy through the emergence of large, mechanically cultivated farms benefiting from supposed returns to scale.

These arguments usually point to such sources of increased returns to scale as greater efficiency of labor through the use of machines, timeliness of mechanical cultivation, etc. Sometimes a bit of the "romance of the tractor" seems to hover unconsciously in the background. In developing this line of reasoning relative to land transfer programs, it is sometimes overlooked that in crowded underdeveloped countries non-physical factors are equally and perhaps more important sources of greater efficiency. Such factors as better trained management, access to credit, and quality control may be particularly mentioned. There remain, too, a whole range of physical improvements suited to small-scale peasant farming such as fertilizer and better seed which may involve no machinery at all and may well be labor-increasing in their effect.

The advantage of the peasant in agriculture, even without the benefit of these innovations, is substantial and should not be ignored. In rice culture, for example, the peasant may have an advantage over large-scale farms in such items as low capital requirement and thus low capital cost in an economy where capital is scarce, low labor cost, ability to expand his labor supply easily at peak sessions through the use of family labor, timeliness in operations with high labor requirements such as transplanting, and the production of fuel for draft power on his holding in the form of pasture.

In Viet Nam, as a case in point, there were several large-scale undertakings prior to World War II which grew rice with mechanical equipment in the Mekong delta region to the southwest of Saigon. They operated in an institutional framework which in no way hampered the expansion of extensive rice cultivation. Yet it appears that these firms were profitable not because of labor saving techniques but largely because they had access to low cost government-sponsored credit not available to small farmers and because they were able to control the quality of the rice they produced through seed selection. It is interesting to note that these firms never became really common, and that side by side there existed equally large—and apparently equally profitable—large ownership units which were rented out in two-hectare parcels to tenant farmers. After the war, although there was no restriction on these large-scale operations until the enactment of a land transfer law in October 1956,[1] all but one of these mechanically operated farms changed over to individual tenant operation.

Arguments based on microeconomic analysis tend to ignore one of the most critical factors to be considered in analyzing the economic effects of land transfer programs or of a shift from small-scale, peasant agriculture to large-scale farming. To be economically justified in a peasant economy, a large-scale mechanically operated enterprise must not only be able to produce more cheaply than the present farmer—a formidable challenge in itself—but must in addition be more efficient to compensate for what might be termed the social opportunity cost of any peasant labor left unemployed. It is an unfortunate fact that in most underdeveloped nations today not only are present alternative opportunities lacking, but there seems little prospect that non-agricultural employment can expand rapidly enough to much more than absorb expected population increases, at least during the next generation or so. In effect, the individual large farm in a crowded peasant economy may be able to shift some of its costs of production to another sector of

[1] For details see Price Gittinger, "Vietnamese Land Transfer Program," *Land Economics*, May 1957, p. 175.

the society—i.e., in the form of unemployment—but this cost cannot be eliminated from the social account nor ignored in assessing relative efficiencies. The society cannot be content to analyse the large farm from the standpoint of firm analysis only.

For underdeveloped peasant economies with high population densities and where industrial development cannot be expected to increase rapidly enough to absorb any large amount of rural labor freed by labor-saving innovations in agriculture, this analysis indicates that the goal—even in the distant future—is not large-scale farms in any way comparable to Canadian or United States wheat farms, but concentration on greater individual productivity and increased production within the framework of a peasant tenure pattern. The post-war agrarian reforms in Japan, Taiwan, and Viet Nam have been fully in line with this objective. Of course, such land transfers are not ends of themselves, but only open the door to a more healthy rural social structure and to changes in technique leading to greater individual productivity within peasant agriculture.[2]

This analysis does not negate the substantial advantages of plantation-type agriculture for many crops in many different areas. This is particularly true where the plantation agriculture is established on land not used by the peasant economy, as is not infrequently the case in Southeast Asia and elsewhere. In such instances the social opportunity cost arising from displaced labor is, of course, nil and the advantages of large scale operation need not be so great.[3] Yet even in plantation crops, small holders, reinforced through cooperative marketing, credit schemes, and agricultural extension, are often economic competitors for large scale plantations. One may point to small holder rubber in Malaya, to cacao in Ghana, and even to sugar cane in Fiji.

PRICE GITTINGER

International Cooperation Administration

[2] The effect of changing agricultural technology in underdeveloped countries is discussed in Wilhelm Anderson, "Agricultural Technology in the World's Underdeveloped Areas," *Foreign Agriculture*, October 1958, p. 6. The subject is developed more in detail by Anderson in "Technological Developments in World Agricultural Production," *Journal of Farm Economics*, December 1958, pp. 1470-1483.

[3] For an interesting discussion of the place of plantations under present world economic and political conditions see V. D. Wickizer, "The Plantation System in the Development of Tropical Economies," *Journal of Farm Economics*, February 1958, p. 63.

Factors Related to Air Travel in a Large Metropolitan Center

DEVELOPMENTS and improvements in air transportation, particularly since the first world war, have significantly minimized the effectiveness of distance. However, even though great air distances can be covered in a relatively short time, friction in the easy flow of traffic between origin and destination exists because of the expansive space needed at the point of contact between air and land. Since air transportation came into wide use only after the pattern and density of urban settlement was established, the facilities needed for this new mode of travel had to be assimilated into existing community structures. Thus, air terminals were necessarily located at considerable distance from the center of population in most large urban areas. Consequently, movement of passengers to the point of departure by plane presently constitutes a significant part of the total trip. Although air transportation has become increasingly important as a mode of travel, particularly for long distance hauls, little research attention has to date been focused on it. To what extent distance to the air terminal and other factors are related to the use of the plane as a mode of travel are empirical questions. Thus, even a single case study would provide much useful information on these questions.

The present study attempts to describe some of the factors involved in the use of the plane as a mode of travel in the Detroit Metropolitan Area. The study is based on a random sample of 1,214 personal interviews with both out-going and in-coming passengers at the Willow Run Air Terminal which serves the Detroit area. The interviewing covered a full week in the late spring of 1958.[1] It is

[1] The writer is indebted to Mr. Ralph Smith who supervised the field work, and the officials at the Willow Run Terminal for their permission to set up interviewing stations in the concourses.

assumed that the generality of the findings regarding out-going passengers will be enhanced if similar relationships are observed among in-coming passengers, whose flights originated at air terminals throughout the world. Thus, to the extent that the Willow Run terminal is typical, out-going and in-coming passengers should be subject to the same influencing factors. Such a check will be possible only in respect to the few selected variables on which we have data for both types of passengers.

Air passengers are predominately male and a majority of trips are for business purposes.[2] Less than one-fifth of the passengers originating or terminating their flight at the Willow Run terminal during the study period were females. Out-going passengers had a slightly lower proportion of males than was found among in-coming passengers, 79 percent and 84 percent respectively. This is likely due to differences in trip purpose since incoming passengers were more likely to be on business trips than were out-going passengers. Two-thirds of the out-going trips were for business purposes as compared with more than three fourths of the in-coming trips. This difference has a chance occurrence of less than one in one thousand times. It is to be expected, however, since the Willow Run air trade area is predominately an industrial and commercial center, this would disproportionately attract business contacts, whereas out-going passengers would disproportionately include those seeking recreational centers in other parts of the world. As evidence of this we find that one-third of the out-going passengers were on non-business trips as compared with only one-fifth of the incoming passengers.

Mode of travel to or from the air terminal is predominately by private automobile. There is, however, a statistically significant difference by direction of trip. Whereas only nine percent of the out-going passengers came to the terminal by limousine or taxi, 19 percent of the in-coming passengers used this mode of travel when leaving the terminal. The proportion using the bus, slightly more than one-sixth, is the same for both types of passengers.

In distance travelled to or from the terminal there is no difference between in-coming and out-going passengers. Four-fifths of the passengers travelled more than 30 miles to get to or from the terminal. Approximately two thirds of the surface trips were for a distance of 30 to 50 miles. One passenger in eight travelled more than 50 miles from the point of origin to the terminal or to point of destination upon arrival by plane.

Data on out-going passengers show that only 10 percent spent less than one-half hour, whereas, more than half (51.2 percent) of the passengers took from one-half hour to less than one hour to get to the air terminal from the point of origin. More than one-fourth of the passengers reported that they spent from one hour to one hour and a half to get to the terminal, whereas 10 percent spent more than one and one-half hours in surface travel. Because of the similarity in distance travelled by in-coming passengers it can be inferred that comparable time would have been spent in getting to their destination. Thus, for the Detroit Metropolitan area two-fifths of the passengers spent more than one hour in getting to or from the air terminal. However, less than four percent spent more than two hours in surface travel.

That air transportation is used largely for long distance trips is clearly evident from these data. Less than half of one percent of the passengers in either direction travelled less than 100 miles. More than half of the out-going passengers and more than two-fifths of the incoming passengers were on flights of more than 500 miles. There is a significant difference in distance by direction of flight. Outgoing passengers had nearly three times as many in the 1000-miles-and-over category, that is, 28 percent as compared with 11 percent in the incoming-passengers category. Conversely, the in-coming passengers were disproportionately concentrated in the shorter flights, that is, less than 300 miles. These differences are likely due to the observed differences in sex of passengers and purpose of trip. Among out-going passengers there were fewer males and more non-business trips. It is hypothesized that business trips are likely to be short flights and that male passengers are more likely to be on business trips than are female passengers. On the other hand, non-business trips, which are likely to be largely for recreational purposes, are expected to be long distance flights. Distance travelled to the air terminal is expected to be similarly related to sex of passenger and purpose of trip. Thus, we

[2] Tables have been omitted because of space limitations; however, these are available upon request of the writer.

should attempt to measure how distance to air terminal and distance of flight are related to these variables. It is to this that attention is now focused.

It is found that females tend to travel slightly greater distances to the air terminal than male passengers; however within each sex group distance travelled to the terminal varies by purpose of trip. Three-fifths of the males on business trips travel less than 40 miles to the terminal as compared with less than half of the non-business trips. The latter trips are disproportionately concentrated in the 50-miles-and-over category. This is even more marked among females than among males. These data suggest that persons travelling for non-business purposes are willing to travel greater distance to the air terminal than those on business trips. Such a difference is likely due to differences in availability of time as well as mode of travel used. Support for the latter is found when mode of travel to the terminal is related to trip purpose and sex of passengers.

Mode of travel to the air terminal varies both by sex and trip purpose. Females are more likely to travel by private car. The number of males is double that of females who use the bus as a mode of travel to the terminal. Males are also more likely to use a limousine or taxi. However, mode of travel differs more by trip purpose than by sex. It is found also that the same pattern of difference by trip purpose is observed within each sex group. Non-business-trip passengers came to the terminal disproportionately by car, whereas business trips, particularly among female passengers, were more likely to be by limousine or taxi than were non-business trips. It is interesting to note the high percentage of males, on business trips, who came to the terminal by bus. It is more than double the proportion of females who did so. The limousine appears to be especially attractive as a mode of travel for females on business trips, but neither limousine nor taxi seem to attract many non-business passengers. Less than 4 percent of the males and only 2 percent of the females on non-business trips utilize these as a mode of travel to the terminal. Part of the differences observed could be due to distance travelled to the terminal, in that the car and bus would more likely be used for longer distances because of the costs involved and, as already observed, non-business trip passengers travelled longer distances to the terminal than did business trip passengers. Similarly, females on business trips travelled shorter distances to the terminal than males on business trips. For non-business trips females came from a greater distance.

The distance which passengers are willing to travel to the terminal, measured either in miles or time, is found to be related to the distance of flight. Passengers whose flights were for a distance of less than 1,000 miles have a larger proportion who travelled less than 40 miles to the terminal than is found among those whose flights exceeded 1000 miles. Conversely, those travelling more than 40 miles to the terminal are disproportionately concentrated in the 1000-miles-plus-flight category. When distance is measured in terms of time, passengers whose travel to the terminal exceeded one hour are found disproportionately in the long-distance-flight category.

Distance of flight also varies by sex of passengers and trip purpose as is shown in Table I. Among both out-going and in-coming passengers males are concentrated in the short-distance flights, whereas females are concentrated in long-distance flights. The proportion of male passengers leaving Willow Run for flights of less than 300 miles is approximately double the proportion of females. In the 1000-miles-or-more category among out-going passengers we find less than one-fourth of the males but more than two-fifths of the females. Among in-coming passengers the difference is even more marked, that is, nine percent of the males as compared with twenty-four percent of the females.

By trip-purpose, distance of flight varies more than by sex of passenger. Business trips tend to be short distance flights whereas non-business trips are concentrated in the longer-distance-flight categories. The differences are clearly evident in each distance category among both out-going and in-coming passengers. The differences are particularly marked in the extremes, that is, in flights of less than 300 miles and flights exceeding 1000 miles. Only 14 percent of the out-going business trips and six percent of the in-coming business trips were flights of more than 1000 miles as compared with 55 percent and 30 percent of the non-business trips, respectively. Conversely, business trip passengers were disporportionately found to be on short-distance flights. Thus, three-fifths of the out-going

TABLE I—Distance of Flight, by Direction of Flight, by Sex and Purpose of Trip

Sex and Trip Purpose	Distance of Flight					
	Under 200	200–299	300–499	500–1000	1000 plus	Total
			Out-Going			
Male	10.5	25.1	15.3	25.1	24.0	100.0
Female	5.3	9.9	13.0	30.5	41.2	100.0
			In-Coming			
Male	15.1	27.1	15.8	33.4	8.7	100.0
Female	8.1	23.0	16.2	28.4	24.3	100.0
			Out-Going			
Business	11.7	29.6	17.9	26.0	14.0	100.0
Non-Business	5.7	7.5	8.8	23.3	54.6	100.0
			In-Coming			
Business	16.7	30.1	15.9	31.4	5.9	100.0
Non-Business	3.8	15.4	12.5	38.5	29.8	100.0

business trip flights were for a distance of less than 500 miles as compared with slightly more than one-fifth of the non-business trips. A similar but less marked difference was observed among in-coming passengers.

Since males tend to travel shorter distances than females and since males are also more likely to be on business trips, the differences observed by trip-purpose may be due to the sex composition of passengers. As a partial test of this we have observed distance of flight by trip-purpose with sex of passenger as a control variable. This is done in Table II for out-going passengers only. Again the same relationship between trip-purpose and distance of flight is observed. However, it is noted that female business flights are for greater distances than male business flights. Only 30 percent of the business flights by females were less than 500 miles as compared with 60 percent of the business flights by males. Thus the earlier observation that females travel greater distances than males is found to be due in part at least to difference in trip-purpose, for in non-business flights males travel greater distances than females. Within each sex category, non-business flights are longer than business flights, but the difference is more marked among males than females. It is of interest to note that only 13 percent of the male business flights are in the 1000-miles-plus category as compared with 60 percent of the non-business flights. Among females less than one-fourth of the business trips and nearly one-half of the non-business trips are in this distance category.

TABLE II—Distance of Flight by Trip-Purpose by Sex

Trip—Purpose and Sex	Distance of Flight			
	Under 500	500–1000	1000 plus	Total
Total	47.1	25.6	27.3	100.0
Male				
Business	60.1	26.5	13.3	100.0
Non-Business	20.8	19.2	60.0	100.0
Female				
Business	30.0	26.7	23.3	100.0
Non-Business	11.6	29.5	48.4	100.0

Our data show that air transportation is used predominately by males and for business trips. Although air travel is largely for long distance hauls, distance of flight varies by sex of passengers and purpose of trip. It is also observed that the distance people are willing to travel to the terminal varies by trip purpose. Business-trip passengers travel shorter distances than non-business passengers. This is particularly the case among males. Also the longer the flight the greater

the distance passengers seem to be willing to travel to the terminal. Thus, since business flights tend to be short, accessibility to the terminal is likely to be an important limiting factor in the use of the airplane as a mode of travel. These findings suggest that if air transportation is to become increasingly attractive as a mode of travel, particularly for business purposes, the point of contact between air and land needs to become more accessible, if not in distance, at least in time.

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Comments on Economic Base Theory

ECONOMIC base theory takes two forms in computation. The first stresses the home location of the purchaser. It holds that when the purchaser is a resident or an establishment of the city where the actual physical acquisition of the good or service takes place, the activity giving rise to the exchange is service activity; in contrast, the activity is basic when the purchaser is a resident or an establishment of another place. Thus Andrews[1] classifies goods, services, and capital shipped to other places as basic activity as well as the activities which involve residents of other places visiting the community in question to procure their goods, services, or capital. Service activity, in turn, involves the import of goods, services, and capital or the acquisition by residents of domestically-produced things.

In its second form, an approximation is used. It holds that if there are more people engaged in a given activity than one would expect under ratio comparisons of local employment to total employment in the industry compared to local population and national population, the activity is basic; it is service if the opposite inequality holds. For many activities, purchasing power, or "state" rather than "national" comparisons, to give vent to cultural factors, are preferred.

It is the thesis of this paper that the economic base theory fails in either form. This, we believe, can be argued on rather elementary levels of economic theory. Indeed, it is suggested that the great favor with which economic base theory has been received is partly a reflection of the conceptual omission, for reasons of bias or forgetfulness, of what are rather basic principles of economic theory.[2]

[1] "Economic Base: A Classification of Base Types," *Land Economics*, November 1953, pp. 343-350.

[2] Economic base theory was originally the contribution of Homer Hoyt. (See his "Economic Background of Cities," *The Journal of Land & Public Utility Economics*, May 1941, pp. 188-195.) Recent criticism has stemmed largely from R. W. Pfouts (e.g., see his paper with E. T. Curtis, "Limitations of the Economic Base Analysis," *Social Forces*, May 1958, pp. 303-310). For general reviews, see T. S. Chapin, Jr., *Urban Land Use Planning* (New York: Harper & Bros., 1956), pp. 104-117, and R. B. Andrews, "Mechanics of the Urban Economic Base: Historical Development of the Base Concept," *Land Economics*, May 1953, pp. 161-167. For extensive use, see the several reports by Homer Hoyt Associates of community development and potential such as of Arlington, Va., and Brockton, Mass. The Federal Reserve Bank of Kansas City, Missouri has used the economic base concept as a focal point in its study of *The Economy of Albuquerque, New Mexico*, 1949. The city planning commissions of Cincinnati and Chicago have also made intensive use of this theory, as well as many others.

The Theory Evaluated

Consider first the form which stresses the residence of the purchaser. This basis of classification has origin points in international trade theory, with roots in the distant past when mercantilism held popular sway. On intra-national, inter-community levels of analysis, however, labor and capital are considered to be fully mobile, so that retailing and service trades occupy central position in the list of service activity with manufacturing being considered generally as basic. Of course as between nations, much of manufacturing output is consumed domestically. This condition creates a somewhat different picture for the international case compared to the inter-community situation under the "residential" form of economic base theory.

Notwithstanding fine distinctions between inter-community economic base theory and international trade theory, it is the fact that the former has borrowed much of its fundamental idea from mercantilism. It assumes that basic activity (shall we say, manufacturing activity) is needed to support service activity (let us say, retailing activity). Thus ratios are proposed for study so that the numbers employed in service activity may be compared to the numbers employed in basic activity. The thought is kept in mind that the lower the ratio the greater is the potential expansion of the community. Ergo, the

mercantilist's idea is reflected that a favorable balance of trade attracts gold and gold results in desired events.

Unfortunately for simple community studies, economic life does not work out in the narrow way just described. Let us use simple numerical examples to illustrate our objections.

Conceive of two communities similar in all respects save those to be described as follows: In the one, the output of local manufacturers (Product A) is sold outside of the community, while in the other the output of local manufacturers (Product B) is consumed domestically. The question then may be asked whether the initial community is in a naturally better position than the second community. In answer, suppose we assume that Product B is a necessity to the residents of each community. The one community, in effect, trades Product A for Product B with outsiders; the second community produces its own Product B. The better community is the one which follows the law of comparative advantage. Production of A just for the purpose of having a favorable balance of trade is uneconomic unless the comparative advantage lies with such product.

Suppose we change the industry focus a little and imagine all other things equal save retailing or professional activity. In the one community large specialized department stores of type A and skilled professional activity of Type A′ exist, such that residents from other places come to the subject community for A and A′. Meanwhile, we assume that residents of the community and all other communities require some A, some A′ and (respectively) about the same quantity of B and B′. In another community, local stores and professional people are not so specialized. Product creation is spread rather evenly among A and A′, B and B′. Manifestly, the original community is superior only if it, unlike the second one, is following and also has basic economic advantages.

In essence, economic base theory makes sense provided that the principle of comparative advantage is being followed. But this is a far cry from saying, for example, that it is only necessary to find 2,500 basic jobs to secure a total of 4,500 jobs.[3] The securing of a new motel run and operated exclusively by the motel owner's family does not signify the forthcoming employment of X number of service workers just because the motel's income is derived from out of town residents. The opening up of an equivalent size barbershop operation, which causes local residents to stay in the subject community for hair-cuts rather than go elsewhere, is as fully stimulating a location accomplishment as that of gaining a new motel.

Now these simple principles recognize the desirability of specialization, but they recognize them through the law of comparative advantage and not from some arbitrary system which asserts 1 basic to 2 service, *etc.* No mechanistic rule can be applied to foretell future community growth. What matters to a community in terms of future wealth is not the situs of consumers nor the number engaged in an activity; that which is important are the time-worn factors of resource, skill, and *kind of activity* taking place in the community.[4]

All cities in the United States will have some basic and some service employment by any yardstick used to measure the type of employment in the city. The growth of the community depends not on the ratios between the two but the kind of, or shall we say, quality of the basic and service activity taking place in the community. It is, for example, a more significant accomplishment for a city to attract a good restaurant which caters in style and service to local preferences and is pleasing in appearance than to attract a restaurant which does not fit the community pattern nor physical landscape even though its specialized kitchen does attract out-of-town customers more readily than the former. This example brings us to the kernel of truth behind economic base theory. We will see it best and hence describe it in terms not of where the buyers of the product are located but in terms of the number employed in the activity; that is, we use the economic base approximation analysis (as explained below to show the proper light for considering the economic base of a community).

Approximation analysis may be understood most readily by stressing the final form of a good rather than by concentrating on the earlier forms taken by the good. For ex-

[3] Homer Hoyt, *A Report on the Economic Base of Brockton* (Brockton, Massachusetts, May 1958), p. 16.

[4] This is, of course, the reason why statistical measurements of community growth are not dovetailing with basic-service employment ratios. See, R. W. Pfouts and E. Curtis, *op. cit.*

ample, suppose finished product Z is produced in two distinct phases of operation. Stage 1 takes place near the source of the materials, which we imagine means in our own community. Stage 2 is located in the distant northeast. The residents of "our" community purchase from the proprietor of Stage 2 such amount or portion of the final output as is proportional to the ratio of the persons living in our community compared to the total population of the nation. In effect, some part of the output (as yet not designated in our description) is being brought back to our community in the form of the output of Stage 2.

By focusing attention on the location of buyers of our output, one tends to visualize all those who are engaged in Stage 1 as basic employees. In fact, however, they are not. Only those who are in excess of the number required to produce that share of the total output which is ultimately consumed by local residents are basic employees; all others are service. Let us put it this way. There are 100 workers in the industry, 50 employed in Stage 1 in our community, 50 employed elsewhere. The residents of our community are half in number of the total population of the country and they purchase half of all final products produced ,and sold in the country. It follows that the 50 workers out of 100 are in proportion to population and consumption. Even though their particular output is sold entirely to non-local buyers, so that in effect it is exported, we call them non-basic (or service) workers. In effect, their output is consumed locally, albeit in another form.

By considering an industry as an entity rather than having focused attention on all of its sub-stages, one moves toward the view that all output is consumed in part by the residents of all normal or average communities. Even the work of the sailor in the Pacific is allocatable to each community. In the same way, a given community may be fabricating a precision instrument that ultimately is used in a distant factory for producing a machine which eventually helps yield glassware. This glassware, we note, is purchased in part by the residents of our given community.

We conceive then of all production being consumed by all people, and suggest that this assumption holds true except for special products which are climatically or culturally restricted to special places. We conceive also of all production being consumed by all people residing at any place in proportion to the number of persons at the given place compared to all of the people in the economy. And though there are exceptions also to this assumption, such as where the income level of people is more important than the number of buyers, or where the sex or race distribution governs the market potential, assumption of effective demand based on population suffices for the broad picture we seek to gain.

Any urban economy then will have the following general characteristics. There will be many people employed in say the food and kindred products industry, none working in the chemical industry, a few working in fabricated metal products, none in apparels, ad infinitum. Whenever the number employed in an industry is in comparative excess of the number to be expected, as determined by the relative population proportion and the total number working in that industry, a basic employment or basic industry will be said to exist for the community. Whenever the number is less than the normatively indicated level (as formed on the basis of relative population and employment in the industry), a service characteristic will be designated to exist.

A greater basic-to-service ratio for one community under so-called approximation analysis compared to another does not necessarily indicate greater wealth. Rather, it may indicate any of the following possibilities. (A) One community may have a larger proportion of its population engaged in the listed kinds of work than the other. (B) The other community may have many retired persons, and other persons living essentially on outside investments, or on work performed elsewhere.[5] (C) The community with the greater basic-to-service ratio may in fact be engaged in industrial activity of low wage-low value added nature and hence be far poorer than the other.

It is this last consideration that justifies the use of industry statistics, for often it does not matter so much that on subindustry breakdowns we may find such a large number employed say in Stage 2 as to yield a basic

[5] This last condition imposes a statistical problem that requires classification of the worker as basic to the community in which he resides. It is a prominent issue in studies of the very large communities where commuting is a pastime; in contrast, it is quite unimportant with respect to the small community.

position while in production Stages 1, 3, and 4 the number employed is relatively small with the whole industry classification yielding a service connotation. By studying the broader industry-by-industry picture, by knowing the community, by drawing up a list of desired industries (desired, for example, because of their high value added-high wage figures), and by conducting location surveys to find out which of these industries tend to gain location advantage in the type of urban economy under study, a view is acquired not only of the particular urban economy in question but of its potential.

Economic base theory is employed correctly in theory only if we presuppose the following: (1) Those industries in the city which employ more than their proportionate share, thereby being basic in nature, are high value added-high wage paying industries. (2) We note that this presupposition of large relative employment suggests that the industrial output is proportionately large and will be shipped over relatively wide sales areas. It would follow that if the output is significantly large and shipped over wide sales areas, the industry segment in question is located near the raw material supply rather than the market. In turn, because the number of raw material centers is limited, so too are locations. Any community that attracts an industry of this kind has therefore attracted something which only a few towns or cities may gain. It follows in turn that because service industries which must locate near to the market are ubiquitous (i.e., found nearly everywhere), the gaining of basic industry rather than service industry is a real accomplishment. (3) In effect, basic industry makes a community profitable so that service industry readily locates in the community. The reverse is not true. The existence of service industry in a community does not entice basic industry to its locale. (4) Finally, the more that *is* exported, the greater the demand that will exist for service industry products and hence the greater the attraction for service industry location.

Unfortunately for the theory the above combinations may not hold. Thus basic industry may dominate in certain communities but be low in value added in production as well as low in size of wage payments to workers. In other communities, service industry may be numerous and dominate but create high value in production and be able to pay high wages per employee. The profitability and appearance of the latter group of cities, in so far as attracting future plants is concerned, could be of higher order than the former. The second presupposition noted above which supports the economic base theory requires conception of a large city or else a substantial relative excess of employment before we may imagine goods being shipped over large areas. Otherwise, it is doubtful that the number of possible-alternative locations are limited; and equally is it questionable that the location of this particular industry in the given community is significant. As a consequence of qualification one and two, we hold that basic industry may not make a town appear attractive and hence bring to it the service industry that one generally finds in at least one of the communities of every county or one of the communities in every other county or third county, etc., as the case may be. And finally, while demand is increased in proportion to the quantity exported, remember that what we call a service industry may "transport-wise" be exporting. It follows that if its product reflects a high value added, the proportionate share of the final product that will be obtained by the community in question will be greater than that which the same community obtains from a basic industry that creates a low addition to value through manufacture. In effect then what really counts is the type of activity taking place and not the location of the buyer nor the specific classification we give to an industry on the basis of employment.

May we summarize and conclude with this illustration. If A is a college professor whose services are in effect consumed by residents of other communities, A's need for goods and services is considered to cause additional retailing, construction, and similar activities to take place in the community in question. It appears *as if* he does not supply his own needs, and hence it is good for the community to attract him.[6] But clearly A has a multiplying-effect on community growth greater than himself compared to a so-called service employee only if his skill and presence in the community causes required service activity to locate in that community. Alternatively phrased, if B, a life-long dweller of apartment houses, establishes a green-house in the com-

[6] See the Federal Reserve Bank of Kansas City, Missouri, *op. cit.*, p. 45, for such idea put in practice.

munity and sells only to local buyers, his needs for goods, housing, and other services, combined with his beautification of the city, may add more to the potential growth of the community than is added by my own favorite person: the college professor. Our conclusion thus is this: A community desiring growth should seek the industry which offers the highest value added, the least cyclical sensitivity, the best cultural effect, the most challenging and promising employment, and/or other standards formulated under criteria acceptable to the residents of the community. Single stress on whether the activity is basic or service cannot be helpful; it only makes the analyst's life a lot easier, which perhaps is meritorious in its own right but not academically sound. One must look toward simple principles of comparative advantage in evaluating the economic potential of a community *and the activities to be sought.*[7]

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[7] Applications of the base theory and alternative propositions are contained in a private report to the Industrial Development Branch, The Engineering Experiment Station, The Georgia Institute of Technology, Their effectiveness in use in this area as well as elsewhere will be of interest to all who are concerned with industrial and community development.

Comments by Regulatory Commissioner on Utility Management†

AN UNDOUBTED advantage accrues to any company that has a record of efficient operation whenever that company, for any reason, must do business with its regulatory commission. The manner in which a commission may approach the problems with which it has to deal is often clearly marked out by law. This is largely the case with the question of service. One of the best-known recent cases, decided in 1953, involved the Elyria Telephone Company in Ohio.[1] In this case the Ohio commission approved a rate increase as just and reasonable. There was so much objection to that action that, after a rehearing, the commission reduced some of the proposed rates and suspended all of the others. It also reinstated the old rates until certain improvements in service and facilities could be made. Also, a restriction was placed on future dividends of the company. On appeal, the State Supreme Court reversed the commission on both of these points, holding that the commission had authority to regulate both rates and service but could not make adequate rates contingent upon service improvements. This case presents that particular legal issue as clearly as one would ever expect to find it. There was no controversy in court about the value of the utility's property and apparently no argument about the proper rate of return or the proper expenses. In the rehearing the commission made no attempt to change its previous findings on any of these issues. It simply refused to allow a fair return as long as the service was unsatisfactory. The court held that the commission could not do this and particularly pointed out that if the utility was not allowed a fair return it would not be able to attract the capital required to buy the equipment needed to improve the service. The commission had the duty to fix fair rates. It could also order service improvements but it could not make one dependent upon the other.

The Florida Commission tried to do the same thing at about the same time.[2] It found that the Florida Telephone Company was entitled to a rate increase of 18 percent but it refused to order any increase until the company's service was improved. Perhaps if the commission had merely tried to reduce the rate of return it might have been successful but when it withheld a revenue increase of 18 percent it was withholding all of the earnings and some of the expenses also. The Florida Supreme Court set aside the order and cited the Ohio case. The reason which it gave for reversing the commission was that, in the Florida law, service and rates are dealt with in separate sections of the statute. The court held in essence that these two subjects must be covered in separate proceedings. In

† These comments were made by the author, who is Commissioner, Illinois Commerce Commission, speaking before the Illinois Telephone Association, May 21, 1958.

[1] *Elyria Telephone Company* v. *Public Utilities Commission*, 158 Ohio St. 441, 110 N.E. 2nd 59 (1953).

[2] *Florida Telephone Company* v. *Carter*, 70 So. 2d 508 (1954).

this case also the rate limitation was so great that the telephone company had very little chance of getting the capital needed to correct its poor service.

In a New Jersey case[3] the commission allowed an increase in rates to a water company which was not giving adequate service. The city of Elizabeth appealed the order but the commission was affirmed. The court said: "A starved utility is in no better position to render proper service than a starved horse or a motor car without fuel." This appears to be sound law. It does not render a commission impotent in dealing with cases of bad service. The commission enjoys considerable discretion as to the exact level of rates which it may prescribe. It must determine the fair rate of return and the fair value of the plant, and it is evident that these findings necessarily involve much discretion on the part of the regulatory body. Even after a commission has arrived at its conclusions on these points, there still remains a zone of reasonableness within which rates may vary. This is shown by a case in the state of Maryland in which both the city of Baltimore and a street car company appealed from the commission's rate order.[4] The court denied both appeals and sustained the commission. It rejected the city's appeal because even poor service does not justify confiscatory rates. It denied the utility's appeal on the ground that the commission had used discretion as long as the rate which it fixed was above the confiscatory level.

It has been my experience that a company whose service to the public is below standard is also a company that must be watched on other matters as well. Generally, its books and records are not properly kept and its reports to the commission are not filed on time or, when filed, are not properly prepared. A company's shortcomings in this kind of a situation go beyond failing to render proper service to the public and go over into the area of inefficient operation generally. And this is not good because a commission's confidence in the efficiency of a company's whole operation is shaken. It cannot be sure, without extended investigation, that all claimed items of expense are valid; that there has been a determined and effective effort to keep operating costs down; that expenditures were made for the proper purposes; that certain reserves are proper; that proper credit is taken for all proper revenues; that the company's rural line extension policy is fair; and that a conscientious effort has been made to sell the service and maintain good public relations.

Management has certain prerogatives—a special domain, so to speak—on which a commission may not trespass. This is as it should be because good management knows more about its problems and how to deal with them than any public official can know. However, when a commission's confidence is shaken on some of the counts I have just enumerated, it cannot help having some misgivings about making additional gross revenues available to a company when it cannot be sure that the result will be a definite strengthening of the company's overall financial condition so that it may more effectively carry out its responsibilities to the public and to its investors. This attitude on the part of a commission does not stem from a hostile feeling toward the company which makes the commission want to punish it. That would be wrong as well as short-sighted because it is the public that would suffer. The commission, in this kind of a situation, must be dispassionate and philosophical, realizing that a small minority of poor operators will always be with us, and then take such steps as it can to encourage improved operation by pointing out its advantage from just a regulatory point of view alone—that over the long run good earnings are the key to good service and to the most economical service.

Telephone rates and telephone service have a very real and practical effect on each other in terms of how much service the public wants to buy and how much it is willing to pay. Even though a company has a monopoly of the telephone service in a particular territory, it is still competing with every other kind of service for what it hopes will be a reasonable share of the customer's dollar. Perhaps we can call this a sort of regulation by competition or by economic law. But it is primarily the responsibility of each company's management and a commission can only authorize an earnings level. The utility must then go out and attempt to realize that earnings level through the sale of its service in competition with all other businesses.

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[3] *City of Elizabeth* v. *Board of Public Utility Commissioners et al.*, 99 N. J. Law 496, 123 Atl. 358 (N. J. Errors and Appeals, 1924).

[4] *Baltimore Transit Company* v. *Public Service Commission*, 112 Atlantic Reporter, 2nd, 687 (1955).

I have found in some situations that there have been expressions of opinion to the effect that there is too much regulation. If this is true, it implies an awareness on the part of utility management that it is able to stand on its own ability, initiative and resourcefulness to solve its problems and also an awareness that there is a definite limit to the really effective assistance that a commission can give. A rate increase will not solve all problems. I quote here, on the subject of utility earnings part of a concurring opinion which I wrote in 1952 in a General Telephone Company rate case:[5]

"The increase in rates granted here will enable the General Telephone Company of Illinois to continue to finance its large program of plant construction and improvement. This program is absolutely necessary in order to provide its subscribers with the caliber of telephone service which the public wants and deserves.

"The fact that this company has raised large sums of money in the past is no warrant for assuming that it can continue to do so, since the suppliers of capital will inevitably look askance at the continuing demand for money to provide service unless the company receives revenues with which to supply the returns which capital must have.

"In my view, the net result of this approach is more in the public interest than a course of regulation which, it seems to me, must ultimately eventuate in deterioration in the quality of service to the public."

[5] *Public Utilities Reports*, New Series 98, 301 (1952).

Let us look now at the other side of the picture—at a company which stresses alert, efficient management. It does not have to be a big or even a medium-sized company, but may very well be, and often is, a Class C or Class D company. (The telephone companies are rated by our commission according to the amount of their annual gross revenues.) A good company files its reports on time—and properly prepared. Another good sign is the absence of service complaints from its operating territory. When over an extended period of time we get complaints in considerable number it is only natural that we begin to form impressions. As you know utility regulation is not an exact science. We are not long in forming favorable impressions of a company, large or small, that shows that it is trying to do what it is supposed to do, including maintaining good customer relations. As a practical matter, such a company makes our job easier. It has been my experience that the most bitterly fought rate cases are those in which the public feels that it is not getting good service for its money. But when the company bears a good reputation with the public and therefore, most probably, with the commission also, the commission, at a time when it is beset by other complex problems, naturally views with great satisfaction the record and standing of this company. It will recognize that such a company is fulfilling its mission, namely, rendering good service to the public.

CYRUS J. COLTER
Commissioner,
Illinois Commerce Commission

Review of International Cooperation Administration's World-Wide Housing Programs

THE two major factors creating the world-wide housing problem are population growth and the urban in-migration which is taking place with and without industrial development. Outside of the United States, Canada and a few countries in Western Europe, the rest of the world suffers from acute housing shortages.

After remaining static for centuries, world population doubled from five hundred million to one billion in the two centuries from 1650 to 1850, then more than doubled in the last hundred years to two billion five hundred million; and at the present time it looks as if it may double again to five billion in the next fifty years.

In vast areas of the world new housing construction has been sufficient to meet the housing needs of only an infinitesimal percentage of this increased population. We quite naturally think first of the challenge this population growth brings to food production but we cannot overlook the fact that additional millions each year are competing for space and shelter which are already in short supply. While statistics on the rate of new

housing construction are not reliable except in the more highly developed countries, reasonably accurate estimates by the Pan American Union indicate that the present annual rate of new housing construction in Latin America is barely sufficient to meet the housing needs of one-third of the annual population increase. This does not take into consideration the housing destroyed by fire, earthquakes, industrial and urban expansion, etcetera. In other words, the housing shortage is increasing rather than decreasing. Expressed as a comparison to the United States, we build at the rate of one new house for each three and a fraction persons added to our population each year, whereas in Latin America there is only one new house built for every sixteen persons added to the population annually.

The problem is further aggravated by the world-wide movement of people from rural to urban areas. Fifty years ago there were more cities of over 100,000 population in Asia than in Europe or North America and during the last fifty years the growth of large cities has been more rapid than in Europe or North America. Today there are more families living as squatters than living in houses in many Asian cities.

In the western hemisphere, of the seven metropolitan cities with a population of two million or more, only three are north of the Rio Grande River, the other four are to the south. The same massive population movement to these and the other cities of Latin America and Africa is taking place every day.

All of these factors exert a tremendous impact on land costs, housing costs, pressures for government action, and so forth. In addition to the competition for scarce land there is the competition of investment capital going into land acquisition because of a lack of other investment opportunities. The investment and savings opportunities which are so readily available to the middle and professional classes in the United States do not exist in the under-developed countries. Furthermore, with the constant threat of inflation, one finds even servant girls buying vacant, unimproved lots on the installment plan. As a result, for example, vacant land in the suburbs of San Jose, Costa Rica costs more per square foot than in Bethesda, Maryland.

Competition for shelter space brings about profiteering in slum properties to the point that families in the slums frequently pay more rent per square foot for a single room than rental rates in better class apartment buildings in the same city. Housing construction costs are high due not only to the high profit expected by the builder but because of the low productivity of the workers all along the line. The worker in the saw mill is paid only one-tenth of what a United States worker receives, but the finished lumber will cost more per board foot than in the United States despite a much lower raw product cost. The builder is under no compulsion to lower costs because he is building for only the luxury, not the mass market. And there is no point in his trying to build for the mass market when no credit facilities exist. There are millions of families in these countries who would buy their own homes even at relatively high prices if they could obtain the same kind of mortgage financing which is available in the United States through the Federal Housing Administration, building and loan associations, etcetera. At present they must pay all cash or practically all cash. We would not have the active home building industry we have today in the United States if the American public had to meet such credit terms.

When one considers the scope and the magnitude of the world-wide housing problem, it is obvious that all the economic assistance the United States could conceivably provide in this field would not make any substantial impact in solving the total problem. Therefore, we start with the assumption that the International Cooperation Administration's (hereinafter referred to as ICA) activities must be limited to helping other countries solve their housing problems with their own resources, both human and material.

ICA Activities

ICA works closely with other public and private agencies with interest in the field of housing and planning. The comments on the problem set forth above are concurred in the Chiefs of the Housing and Planning Divisions of the United Nations and the Pan American Union with whom we meet frequently. The Chief of the Housing Division participates in housing and planning seminars sponsored by the United Nations. The Latin American Branch Chief of the Housing Division is presently participating in the Second Inter-American Housing Conference sponsored by the Pan American

Union in Lima, Peru. The Inter-American Housing Center of the Pan American Union in Bogota, Colombia, is used by ICA for third-country training in housing and city planning. Together with the Chiefs of the Housing and Planning Divisions of the United Nations and the Pan American Union, the Chief of the Housing Division is a member of the International Housing Committee of the National Association of Housing and Redevelopment Officials which meets regularly in New York to discuss problems in this field. On this committee are representatives of a number of United States organizations such as the American Federation of Labor-Congress for Industrial Organization, American Institute of Architects, and so forth, with interest in international Housing and planning problems.

The Housing Division also maintains close liaison with the International Committee of the National Association of Home Builders, the American Chapter of the International Real Estate Federation, International Union of Building Societies and Savings and Loan Associations, International Federation of Housing and Planning, and other public and private groups in this field.

For technical backstopping ICA utilizes the services of the Housing and Home Finance Agency and its constituent agencies. The Housing and Home Finance Agency has been most co-operative in making its top-level officials available for short-term consultancies to ICA overseas on a non-reimbursable basis. For example, during the year 1958 the Assistant General Counsel of the Agency spent a month in Peru helping to draft housing legislation and Commissioner Steiner of the Urban Renewal Administration recently reviewed housing and city planning problems for our USOM in Tunis. The Housing Division is also making increasing use of short-term consultants from private industry. Private home builders and building and loan executives have made effective contributions in the housing field overseas and at relatively low cost to ICA, considering their normal earnings in the United States. Our liaison with private United States trade associations has been most helpful in recruiting such consultants.

Functional Breakdown of ICA's World-Wide Housing Activities

1. Research and Demonstration Projects. Simple research and demonstration projects can be most effective. For example, a research project costing less than $500 showed Israel how ceiling heights could be lowered without discomfort. Israel now tells us that the saving in housing construction costs because of lower ceiling amounts to over $2,000,000 a year. Modest research in the use of indigenous materials and demonstration materials and demonstration projects have been successfully carried out in a number of other countries, particularly Costa Rica, Colombia, Chile and Korea.

One of our Korea projects is directed toward increasing the production of indigenous building materials and developing new materials from available raw materials with the goal of reducing the need for imported materials. A sixty percent reduction in such imports is anticipated by 1962.

A proposal to do some research in the use of the most universal building—earth—has been included in 1959 inter-regional funds. It is believed that further research on low-cost roofing might have a tremendous impact on housing costs.

2. Aided Self-Help Housing. This is primarily the utilization of human resources; it is not a cure-all to solve the world's housing problems but a tool that can be used in many places. Low-income families who could not otherwise afford decent homes are organized into co-operative groups to build their own homes in their free time, backed by technical guidance, loans of equipment and financing for land and materials. In some of our rural projects where many of the components were fabricated by the participants themselves, adequate houses have been built for as little as three hundred dollars. In an urban project in Santiago, Chile, earthquake-resistant cement block houses with bathrooms and kitchens have been built at a cost of approximately a thousand dollars. In Guatemala City, houses are being built today at a cost of about two thousand dollars which are superior to houses built by the government of Guatemala a few years ago by the usual contract method at a cost of over four thousand dollars each. More important than the fact that such programs produce more houses at a lower cost and with a smaller investment of capital is what they mean in developing human resources—responsible citizens with self-respect. Successful, aided self-help housing programs are now under way in Korea, Chile, Guatemala, and Costa Rica. One will be initiated in Nicaragua shortly.

3. City and Regional Planning. It is already evident that in our haste to help some countries in their economic development we may be guilty of helping them repeat some of the mistakes which we made in our industrial development in the nineteenth and twentieth centuries and which we are now trying to correct at great expense.

A recent example, due to lack of prior general planning, was the proposal to build a major highway in the only land area suitable for industrial expansion in Bangkok. Fortunately, a city planning team under contract with ICA arrived in time to point out the error and relocate the highway. In Nicaragua technical advice in city planning has successfully demonstrated economical solutions of problems of urban growth. We believe that technical advice and training in the field of city and regional planning have not been given sufficient attention by ICA.

4. The Building Industry. Residential construction alone represents over six percent of gross national product in the United States but is negligible in most of the countries in which ICA is working. In order to assist these countries in this area of economic development, more training of foreign nationals is required in the training of skilled construction workers, architects, engineers, and the businessmen to organize and carry out construction operations.

5. Legislation and Orgainzation. Frequently the problem is lack of adequate legislation or organization—public or private. For example, a study of the housing problem in Taiwan revealed that the laws of China had no provision permitting the foreclosure of a mortgage. Without such a provision there was little possibility of mortgage financing. Legislation was prepared and has now been adopted by the government of China. In other instances we have provided assistance in setting up or reorganizing government housing agencies. In one instance we have provided assistance in organizing a private trade organization in the housing construction field.

6. Savings and Credit. This represents a high priority area. In planning capital formation, we have neglected the potential represented by the accumulated savings of the public. In the United States this represents over fifty percent of the resources of our major lending institutions. There is a universal desire for the security that savings represents. ICA should do more to encourage the formation of thrift and credit institutions. One of the greatest motivations for savings is home ownership. To help stimulate the creation and development of savings and credit institions ICA has authorized the use of the so-called PL-480 currencies (funds obtained by the United States Government from the sale of agricultural surpluses) on a matching basis. We believe that we should take more vigorous steps to encourage the formation of savings and credit institutions with particular emphasis on home ownership.

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Book Reviews

Origins of Ownership. By D. R. Denman. London, England: George Allen and Unwin, Ltd., 1958, pp. 180. 22S 6d.

This short but scholarly treatise is a most welcome contribution to a vital subject matter which too long has lay dormant in "the no-man's land between legal, economic and sociological thinking." Mr. Denman, Lecturer in Estate Management at the University of Cambridge, approaches the subject appropriately in an elemental manner.

Origins of Ownership carries the subtitle "A Brief History of Land Ownership and Tenure in England from Earliest Times to the Modern Era." Four short chapters are devoted initially to a carefully documented summary sketch of existing knowledge regarding the basic tenure relations of Prehistory, Roman Britain, Old England and Norman England. The remainder of the book presents a descriptive analysis of the profound changes in the patterns of ownership and in the corresponding rights of man which actually occurred within the "deep-rooted stability" of the centuries of history interspacing "the drama of the Norman impact and the pageant of Tudor England." This "property rights" review of the Middle Ages should be of special interest to economic and political historians. The review is comprehensive of both the Manor and the Borough.

The initial chapters may not be of absorbing interest to the general reader due to the multiplicity of unfamiliar terms and the stepping-stone style with which the author traverses such a vast sweep of time. The careful student on the other hand, will find here a wealth of readily available information regarding the patterns of settlement and land use and the underlying tenure relations which, in England, provided the social seedbed of the Middle Ages. One will find herein succinct explanations of the nature of emerging social groupings. The survey of the situation under the Norman kings contains a careful analysis of the method and significance of the Domesday Survey. The social structuring and operational nature of the manor is also described in some detail.

Of more general interest, no doubt, is Mr. Denman's description of the way in which the foundation ingredients of modern Western Civilization were sifted through the medium of the Middle Ages. In summary form the revolutionary outcome is viewed as twofold. As land and tenurial services thus became marketable, slowly but surely the free contract took the place of the feudal and customary relationship of man to man. In tracing these developments the author treats of the emerging rights of inheritance, the copyholds, the clarification and monetization of such feudal and manorial incidents as relief, aids, wardship, marriage, primer seisin, escheat, forfeiture, tallage, heriot, merchet, chevage, royal obligations, church dues, and labor services. Attention is also given to the precise nature of the vill economy including that of the villeins work obligations on the demesne and of the community and common right.

Due emphasis is given to the special significance of the continued expansion of money payments into the traditional realm of payments in kind, to the broadening of property rights and of citizenship. Money payments were also "the acid that wore away the feudal bond and opened the way to the development of a land market." The author's comments concerning the medieval land market and the early types of leasehold—the stock and land lease, the customary lease and the contractual lease—form a useful introduction to what he views as an area much in need of close study. The development of the leasehold is viewed as a consequence of the precipitous rise in money wages throughout the fourteenth and early fifteenth centuries resulting largely from the decline in population. As income from the "sale of works," or bonded services, was traditional and not related to the cost of wage labor, the manorial lords were literally caught in a squeeze. The answer they found was the leasehold. Thereby they found a way to avoid paying high wages; the villeins as leasehold tenants be-

came responsible for the labor factor. Mr. Denman also suggests that the early land market was more active among the peasants that at the higher social levels. The land was the hallmark of aristocracy and generally the nobles jealously guarded their birthright. At the peasant level, however, land transactions were much more common and thereby in these early days many scattered tenements were brought together and the diligent peasant also accumulated additional parcels of land.

The final chapter in *Land Ownership*, which relates specifically to the character and creation of medieval boroughs is an especially interesting treatment. The borough is seen as "an oasis of liberties breaking into the arid country of strict feudalism." Among the privileges associated with borough life discussed in some detail are those of court, tenure, trading and self taxation and self government. The gild merchant is seen as a practical expression of the enjoyment of legal immunity from royal tolls under the privileges of trading; "the pride and boast of the medieval burgher." The peculiarities of borough tenure itself are also discussed, all privileges summed up as borough customs being seen as tenurial privileges in the final resort. A quite remarkable similitude is portrayed between modern estate development and the foundation layouts of the new boroughs of the 12th and 13th centuries. Similarly the building covenants of modern estates are shown to have antecedents in the principles of borough establishment.

The concluding section is concerned with the growth of the corporateness status of the borough. Blossoming forth in the late Middle Ages the borough thus achieved personality and bodiliness and thereby the power to control the pattern of ownership within the area of borough jurisdiction. The borough thus became "a landowner among landowners." Through the grant of the "fee farm" the burgesses also became responsible for collecting the borough income from among themselves and paying "the farm"—the Crown dues—out of proceeds. Thereby corporateness was further stimulated and in addition the way was opened for the maturing of self government; a process in which prior guild experience proved of considerable significance.

Denman's *Land Ownership* is a book which will undoubtedly prove to be a contribution of lasting value. A great deal of valuable historical information is brought together within a few pages. The points covered are carefully documented and a useful select bibliography follows each chapter. Although the book primarily is not one of original interpretation it does constitute a masterful survey of existing knowledge and points of view in a very important area.

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Sweden Builds. Second Revised Edition. By G. E. Kidder Smith. New York: Reinhold Publishing Corporation, 1957, pp. 262. Library of Congress Catalog Card Number: 56:11753.

The second revised and enlarged edition of Kidder Smith's *Sweden Builds*, first published in 1950, brings to the reader one of the most interesting urban developments of recent years in the world: the new Vällingby section of Stockholm which, both from a planning and architectural point of view, is remarkable. The new edition contains also an additional contribution by Sven Markelius, one of Sweden's grand old men of modern architecture and for may years chief planner for Stockholm. This article, "The Structure of Stockholm," which first appeared in the Swedish magazine "Byggmästaren," is an interesting analysis of the physical development problems of Stockholm and a discerning companion to his article on "Swedish Land Policy." Unfortunately, none of the excellent illustrations and maps of the original article are reproduced.

Kidder Smith is one of the few analyzers of contemporary architecture who recognizes the role of inheritance in architecture. As in his books on Switzerland, Brazil and Italy, he devotes a chapter to the most significant aspects in Sweden's architectural history: the wood tradition, half timber construction, medieval stone architecture, and the castles and chateaux of a period when Sweden was one of the great military powers in Europe.

The first section on contemporary architecture is devoted to housing. In some sixty pages the author gives a glimpse of what can be done within a rigid framework of government-controlled, space and design standards and economic regulations if there is a will

combined with skill to utilize the amenities of nature and a desire to enrich the living environment of the population as a whole in a rapidly expanding urban society. Significantly, the author begins his review of housing achievements with the sub-titles Housing and Setting, Housing and Shopping, Housing and Balconies, and Housing and External Color.

Other sections of the book give selected examples of schools and other educational buildings, hospitals, religious and civic architecture, and buildings for recreation, commerce and industry. The two sections on Stockholm's parks and shelters and on steel and concrete bridges cover interesting aspects of architectural work seldom found in books on architecture.

As a whole, *Sweden Builds* is thought-provoking and raises questions on the problem so often confronting and plaguing American planners: Where does the function of physical planning end and architecture begin? Can there be a clear separation of these two? The illustrations in the book show clearly how important the environmental setting is for a building and how this setting determines its over-all design and influences the architectural treatment of details. Out of this it is evident that two-dimensional planning for orderly urban growth is not sufficient and that more emphasis has to be placed on a careful and detailed analysis of the perceptual effects of such basic planning techniques as land use plans, zoning plans and provisions, etc.

Sweden Builds, with its excellent photography (for the most part by the author) and short but concise text should not remain an exclusive item of required reading for achitects. Planners and civic-conscious citizens alike should take a look at this book. It might give some ideas on and answers to the problem of how to cope with the "exploding metropolis" and "sprawling suburbia."

To a serious student of architecture though, Kidder Smith's book leaves something to be desired. As Lewis Mumford pointed out in one of his *New Yorker* essays, the various trends in contemporary architecture have by now reached a stage in their development where critical analysis would be more in place and do more good than glamorous sales talks. Without constructive criticism we might soon experience an eclectic renaissance forfeiting the basic ideals of the pioneers of the modern movement.

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